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Facteurs associés à l'alimentation traditionnelle au sein de trois communautés cries du Nord du Québec

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Facteurs associés à l'alimentation traditionnelle au sein de trois communautés cries du Nord du Québec

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Résumé

Cette étude propose d'identifier les facteurs affectant la consommation d'aliments traditionnels à travers une perspective écologique, afin de réduire les taux de prévalence élevés de maladies chroniques et ralentir la forte diminution de consommation d'aliments traditionnels chez les Cris du nord québécois. Pour ce faire, une méthode mixte « *sequential explanatory »,* fut utilisée, combinant quatre groupes focus (n=23) et une régression logistique (n=374) à partir de données secondaires issues de trois études transversales.

Selon les résultats de la régression logistique: l'âge, chasser, marcher, le niveau d'éducation et la communauté de résidence étaient associées à une consommation d'aliments traditionnelle trois fois/semaine ($p<0,05$). Subséquemment, des groupes focus vinrent enrichir et contredire ces résultats. Par exemple : les participants étaient en désaccord avec le fait qu'il n'y avait aucune association entre les aliments traditionnels et l'emploi. Ils croyaient que les personnes sans emploi ont plus d'opportunités pour aller chasser mais peu d'argent pour couvrir les dépenses et inversement pour ceux avec emploi. Ce double effet aurait possiblement fait disparaître l'association dans la régression logistique.

Suite aux groupes focus, plusieurs facteurs furent identifiés et distribués dans un modèle écologique suggérant que la consommation d'aliments traditionnels est principalement influencée par des facteurs sociaux, communautaires et environnementaux et ne se limite pas aux facteurs individuels.

En conclusion, afin de promouvoir l'alimentation traditionnelle, quatre suggestions de priorités d'action sont proposées. L'alimentation traditionnelle doit faire partie des stratégies de santé publique pour réduire les taux de maladies chroniques et améliorer le bien-être des populations autochtones.

Mots-clés : Cris, alimentation traditionnelle, modèle écologique, facteurs, devis mixte, régression logistique, groupes focus

Abstract

To reduce the high prevalence rates of chronic diseases and slow the sharp decline in consumption of traditional foods for the Cree, northern Quebec, this study proposes to identify the factors affecting the consumption of traditional foods through an ecological perspective. A mixed method design was used combining focus groups (n = 23) with secondary data analysis from three cross-sectional studies (n = 374). First, a logistic regression was performed followed by interviews, providing additional information to enrich, clarify and even contradict interpretations based on quantitative analyzes.

In light of the results, two scientific papers were written. The results clearly identified several factors that help or interfer with the consumption of traditional foods. These factors are distributed on four levels of influence :individual, social, community and environmental. A better documentation of environmental, social and community factors is desirable for future research. These findings will have an immediate application in public health planning.

Keywords: Traditional foods, First Nations, ecological perspective, factors, mixed methods research, logistic regression, focus group

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En espérant que ce travail réalisé grâce au financement du conseil cri de la santé et des services sociaux de la Baie James, soit utile à la population crie et permette l'élaboration de stratégies visant une amélioration de leur « miyupimaatisiiun »

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Liste des sigles et des abréviations

CCSSSBJ	Conseil Cri de la santé et des services sociaux de la Baie James
IMC	Indice de masse corporel
Kg	Kilogramme
OMS	Organisation mondiale de la santé
Eeyou Istchee	Terrioire des Cris, en langue crie
Miyupimaatisiiun	Terme désignant la santé, en langue crie
BMI	Body Mass Index
CHB	Cree Health Board
CI	Confidence intervals
CTA	Cree Trappers' Association
Df	Degrees of freedom
Fig.	Figure
Hab.	Habitants
n	Sample size
N°	Number
OR	Odds Ratios
TF	Traditional food
v.	Version
WHO	World Health Organization

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1. Problématique

1.1 Introduction

Au cours des dernières décennies, les populations autochtones du Canada ont subi une augmentation marquée de la prévalence des maladies chroniques, augmentation qui ne semble malheureusement pas en voie de s'arrêter. Aujourd'hui, la prévalence de l'obésité, du surpoids et du diabète chez les populations autochtones est beaucoup plus élevée que dans la population générale, ce qui contribue à creuser un écart important entre l'espérance de vie des Canadiens et celle des Premières Nations(1). Les inégalités en matière de santé qui persistent nous laissent croire que les problèmes de santé sont reliés à des facteurs économiques, politiques et sociaux (2). Au cours de cette recherche, nous nous intéresserons aux Cris du Nord du Québec. Le territoire traditionnel des Cris se nomme Eeyou Istchee, ce qui signifie littéralement « terre des gens » ou « terre des Cris ». Il atteint une superficie de 344 854 kilomètres carrés, correspondant à la superficie des deux tiers de la France (Figure 3, p. I-2). Des données scientifiques montrent que les Cris sont présents sur le territoire depuis au moins 3500 ans, mais certaines hypothèses retracent leur présence jusqu'à 9000 ans (3). En 2009, les Cris du Nord-du-Québec sont au nombre de 14 500 et se répartissent dans 9 communautés (4, 5). Historiquement, leur population n'avait jamais dépassé 5000 personnes (3). Cependant, depuis les 30 dernières années on constate une explosion démographique (5). On s'attend d'ailleurs à ce que la population double d'ici 2028, pour atteindre 25 000 habitants.

État de la situation

En Eeyou Istchee, la prévalence (ajustée en fonction de l'âge) du diabète chez les personnes de 15 ans et plus est quatre fois plus élevée qu'au Québec (6). La prévalence de l'obésité est tout aussi alarmante (7-9); en 2003, l'enquête sur la santé dans les collectivités canadiennes révèle

que 86 % des Cris de l'Eeyou Istchee affichent un surpoids (10, 11). En ce qui concerne les enfants, une étude récente rapporte que 27,5 % accusent un surpoids et que 37,4 % sont obèses (12). Pour ce qui est de l'insécurité alimentaire, l'enquête « Aboriginal Children's Survey » menée en 2007, exposait que 14 % des parents rapportaient que leurs enfants pouvaient souffrir de la faim lorsqu'ils n'avaient pas assez d'argent pour acheter de la nourriture (13). De ce 14 %, le quart mentionnait que cette situation se répétait chaque mois ou plus (13).

Au cours des 50 dernières années, le mode de vie des Cris a changé drastiquement, passant d'un mode de vie traditionnel à un mode de vie moderne (14). L'émergence des maladies chroniques a coïncidé avec la sédentarisation des communautés, la construction des barrages hydroélectriques, l'apparition des industries forestières et minières. L'alimentation des Cris, habituellement fondée sur la consommation de viandes, d'oiseaux, de poissons et de baies sauvages, est maintenant basée principalement sur des aliments provenant de l'industrie alimentaire. En 2002, Receveur, dans un rapport interne du Conseil Cri de la Santé et des Services Sociaux de la Baie James (CCSSSBJ), estimait que la consommation d'aliments traditionnels avait diminué de la façon suivante : Dans les années 50, la consommation quotidienne d'animaux sauvages était de 1,3 kg/personne; dans les années 80, elle diminuait à 0,41kg par jour; jusqu'à 0,23kg par jour dans les années 90 (15). Suite à l'introduction de nombreux produits industrialisés, les Cris vivent une importante transition nutritionnelle s'illustrant par une augmentation de la consommation d'aliments riches en sucre, en sel et en gras, au détriment d'aliments traditionnels, jugés protecteurs.

Heureusement, la plupart des Cris sont toujours impliqués dans des activités traditionnelles et pratiquent la chasse et la pêche (15, 16). Une étude se déroulant de 1998 à 2000 a montré qu'à 9 mois, la moitié des enfants cris avaient déjà fait un séjour dans le « bois » (15). Néanmoins,

la proportion de Cris vivant de la chasse et de la pêche a chuté, comme en témoigne le recours au programme « Income security » destiné aux chasseurs, auquel 40 % de la population faisait appel au début des années 80, contre 21 % en 2001-2002 (15). Finalement, en 1996, 97 % de la population parlait le cri et 85 % l'utilisait à la maison (15).

Plusieurs défis sont à relever en Eeyou Istchee afin d'améliorer les habitudes alimentaires des Cris, qu'il s'agisse de déterminer les facteurs menant à une surconsommation d'aliments denses en énergie tels que les boissons sucrées (17) et le « junk food » (18), qu'à une sous-consommation de fruits et légumes (8, 19, 20). Néanmoins, dans le cadre de mon travail en tant qu'agente de planification et de programmation en nutrition au sein du Conseil Cri de la santé (Annexe VI, Curriculum Vitae, p.VI-2) nous avons organisé à quelques reprises des ateliers afin de déterminer les priorités d'action en nutrition pour la prévention du diabète. Ont pris part à ces ateliers des responsables d'institution, des leaders et des membres des communautés. L'alimentation traditionnelle était toujours désignée comme la première priorité sur laquelle il fallait agir. Ainsi, puisque nous adhérons profondément à cette affirmation de la Charte d'Ottawa qui dit que : *« La promotion de la santé est le processus qui confère aux populations les moyens d'assurer un plus grand contrôle sur leur propre santé, et d'améliorer celle-ci »* (21), il a été décidé d'orienter ma maîtrise vers une meilleure compréhension des facteurs affectant la consommation d'aliments traditionnels chez les Cris.

1.2 Question de recherche

L'objectif de ce projet de recherche est de répondre à la question suivante : Quels facteurs socio-démographiques influencent la consommation d'aliments traditionnels chez les Cris du Québec?

1.3 Domaine de recherche et pertinence du travail

La problématique de la diminution de la consommation d'aliments traditionnels est liée à l'apparition croissante des maladies chroniques, mais aussi aux problèmes d'insécurité alimentaire. Les diététistes du Canada (DC) maintiennent que :

« La sécurité alimentaire de la communauté est atteinte lorsque tous les résidants d'une collectivité ont une alimentation sécuritaire, nutritive et acceptable pour chacun grâce à un système alimentaire durable qui maximise les choix santé, l'autonomie de la communauté et l'égalité d'accès pour tous » (22, p.1).

D'ailleurs, l'alimentation traditionnelle est indissociable de la problématique de la sécurité alimentaire(23, 24); c'est pourquoi le Plan d'action du Canada pour la sécurité alimentaire (1998) plaçait au cinquième rang des priorités le maintien des méthodes traditionnelles de chasse et de pêche des autochtones (25).

Le fait d'agir sur la promotion des aliments traditionnels pourrait s'aligner sur deux objectifs du Programme national de santé publique 2003-2012, soit celui visant à réduire la prévalence du diabète de 40 % chez les autochtones, et celui visant à réduire à 8 % les taux d'insécurité alimentaire au Québec (26).

En répertoriant les facteurs reliés à la consommation d'aliments traditionnels et en travaillant à sa promotion, nous croyons pouvoir augmenter la consommation des aliments traditionnels et éventuellement améliorer l'apport énergétique, l'apport en nutriments et la fréquence de l'activité physique pour atteindre, ultimement, une diminution des taux de morbidité et de mortalité et une augmentation de l'état de bien-être, appelé *miyupimaatisiiun (27-29)*.

En corollaire, parce que menée en partenariat avec le Conseil Cri et les autorités locales, une telle étude aura comme autre avantage d'aider les communautés cries à faire le tri parmi les

habitudes à conserver, liées à un passé traditionnel, et celles à développer pour profiter des avantages de la modernité.

2. État des connaissances

2.1 Alimentation traditionnelle des autochtones du Canada

2.1.1 Description de l'alimentation traditionnelle

Il existe autant de définitions d'alimentation traditionnelle qu'il existe de peuples autochtones. En effet, le système d'alimentation traditionnelle des autochtones est basé sur les ressources locales, c'est-à-dire l'environnement naturel qui les entoure (30). Plus de 250 espèces de plantes et d'animaux font partie du système alimentaire traditionnel des Premières Nations, des Inuits et des Métis à travers le nord canadien (31). La composition d'aliments traditionnels varie d'une communauté à l'autre en fonction des ressources naturelles, des conditions climatiques et des changements de saison (31). Malgré tout, les différents types d'alimentation traditionnelle se définissent tous par une consommation de poissons, de viandes, d'oiseaux et de végétaux sauvages (32). Certains considèrent que la bannique, le thé et le sucre en font aussi partie puisqu'ils sont présents dans l'alimentation depuis le 16^{ième} siècle (33, 34). Kuhnlein & Chan (2000) suggèrent que l'alimentation traditionnelle va au-delà des aliments consommés et englobe plusieurs aspects allant de la chasse à la préparation, de la méthode de cuisson à l'environnement du repas et même à la manière et par qui le repas est consommé (35)*:*

«The term «traditional food system» includes all of the food species that are available to a particular culture from local natural resources and the accepted patterns for their use within that culture. This term also embraces an understanding of the sociocultural meanings given to these foods, their acquisition, and their processing : the chemical composition of these foods; the way each food is used by age and gender groups within a selected culture; and the nutrition and health consequences of all these factors for those who consume these foods»(35, p.596) .

2.1.2 Transition nutritionnelle

La transition nutritionnelle des autochtones réfère aux changements dans les principaux problèmes nutritionnels vécus au sein de ce groupe à travers le temps. Au début du siècle, les troubles sévères de malnutrition étaient prédominants, alors qu'aujourd'hui, les problèmes de santé les plus fréquents sont reliés à une surconsommation menant à des problèmes de surpoids ou d'obésité (36-38). Cette transition accompagne souvent la transition épidémiologique caractérisée par un changement rapide des causes de mortalité et de morbidité, c'est-à-dire qu'avant, l'incidence élevée de maladies infectieuses était responsable des taux de mortalité et de morbidité élevés tandis qu'aujourd'hui ce sont les maladies chroniques (cancers, maladies cardio-vasculaires, diabète, etc.) qui sont responsables des ces taux élevés (36, 37). Popkin a été le premier à décrire ce phénomène pour les populations en voie de développement, ainsi la transition nutritionnelle liée à la transition démographique et épidémiologique décrite par Popkin s'applique bien à la réalité des autochtones (39).

La consommation alimentaire typique associée à la transition nutritionnelle chez les autochtones se caractérise par une augmentation de la consommation d'aliments commerciaux, riches en énergie, au détriment d'aliments traditionnels, soit une diminution de la fréquence, de la quantité et du nombre d'espèces consommés (35, 40).

D'ailleurs, depuis quelques années, la diminution rapide de la fréquence de la consommation d'aliments traditionnels a été largement documentée dans la littérature (41, 42). Cette diminution est considérée comme néfaste pour la santé de la population, car il est reconnu que l'alimentation traditionnelle offre de grands bénéfices pouvant contribuer à réduire les risques de développer une maladie chronique (29, 42-44). Le changement d'un mode de vie basé sur

la chasse, la pêche et la cueillette des aliments traditionnels pour un mode de vie sédentaire dans les communautés a été associé à un déclin marqué de la santé physique et mentale (45).

L'augmentation croissante de l'utilisation des aliments commerciaux pourrait mener à la perte d'habilités traditionnelles et menace directement la transmission des connaissances traditionnelles requises pour consommer les aliments traditionnels (43).

2.1.3 Bénéfices de l'alimentation traditionnelle

Malgré le déclin dans la consommation d'aliments traditionnels, cela demeure une préférence alimentaire pour de nombreux autochtones qui en consomment régulièrement (41, 46, 47). La plupart des études mentionnent des pourcentages de consommation allant de 5 à 17 % de la prise totale d'énergie par jour (48). Heureusement, il semble qu'une consommation d'aussi peu que 5 % de l'énergie totale journalière d'aliments traditionnels serait significativement reliée à une plus grande consommation de vitamine A, de protéines, d'acide gras poly-saturés, de fer et de zinc ainsi qu'à une réduction de la consommation de glucides, de sucrose, de lipides et de gras saturés (41, 42, 49-51). D'ailleurs, en 2009, Downs démontrait que chez les cris d'âge scolaire, même si la viande traditionnelle était consommée de façon occasionnelle, avec seulement 3 % de l'énergie quotidienne, elle contribuait à augmenter les apports en fer et en zinc de façon significative (52).

Non seulement l'alimentation traditionnelle est une composante intégrante de la bonne santé nutritionnelle chez les autochtones, mais elle offre aussi des avantages sociaux, culturels, spirituels et économiques:

« *La chasse, la pêche et la cueillette d'aliments traditionnels, et le partage dans la collectivité de ces produits de consommation est une activité sociale qui réunit les individus, les familles et les générations. Les aliments traditionnels créent et entretiennent entre les individus un*

tissu social et culturel important qui conforte la santé et le bien-être de la collectivité » (31, p.71).

L'identité culturelle est fortement liée au langage et à la pratique d'activités traditionnelles. Ainsi, consommer de la nourriture traditionnelle permettrait l'expression de l'identité culturelle. La pratique d'activités traditionnelles offre des opportunités pour transférer des connaissances entre différentes générations et maintenir la langue vivante en plus de partager des histoires liées aux territoires et à leurs habitants (31). Kuhnlein et al. (1996) effectuèrent un sondage pour documenter les avantages sociaux et culturels de l'alimentation traditionnelle: 90 % des 1012 répondants croyaient que la cueillette et la consommation d'aliments traditionnels permettaient de conserver un lien étroit avec la nature, assuraient la promotion du partage dans la communauté, contribuaient à l'éducation des enfants en enseignant des techniques de survie, la préparation des aliments et la patience (32, 53). Ce même sondage rapportait qu'une chasse fructueuse apportait un sentiment de fierté et de confiance en soi. D'ailleurs, Berkest (1978), soutenait que le maintien des pratiques traditionnelles contribuait à un sentiment de fierté et d'identité (34).

Plus de 70 % des répondants croyaient que la pratique de chasse et pêche offrait une opportunité pour pratiquer et enseigner l'humilité ainsi que la spiritualité (32). En effet, la pratique d'activités traditionnelles peut offrir une relation spirituelle avec l'environnement s'exprimant par une pratique de chasse, de pêche et de cueillette respectueuse des ressources locales (31).

En ce qui concerne les risques reliés à la présence de contaminants dans les aliments traditionnels, ils demandent de comparer les bénéfices apportés par la consommation d'aliments traditionnels aux risques d'une surconsommation de contaminants

environnementaux (mercure, plomb, etc) qui sont présents chez certains poissons et animaux sauvages. Il faut évaluer la quantité de contaminants consommés et la gravité des problèmes reliés à leur consommation. Ainsi, selon les plus récentes analyses de gestion du risque, la consommation d'aliments traditionnels offre plus de bénéfices que de risques puisqu'elles considèrent l'ensemble des facteurs qui contribuent à la santé d'un individu (35, 54-59).

2.1.4 Eeyou Meechum - Alimentation traditionnelle des Cris

L'alimentation traditionnelle des Cris est principalement composée de viandes sauvages (caribou, orignal, ours, castor, etc.), d'oiseaux sauvages (oie blanche, perdrix, canard, etc) et de poissons (corégone, dorée, truite, esturgeon, brochet, etc.). Habituellement, toutes les parties comestibles de ces animaux sont consommées en utilisant différentes techniques de cuisson (friture, mijoté, grillade sur le feu, fumé, etc.). De plus, les baies sauvages (bleuets, canneberges, etc.) et la bannique (pain traditionnel) sont aussi considérées comme faisant partie de l'alimentation traditionnelle des Cris.

La disponibilité des aliments traditionnels varie selon les saisons et les cycles des espèces animales; par exemple, l'oie blanche est chassée à l'automne et au printemps puisque c'est à ce moment que son trajet migratoire lui fait parcourir l'Eeyou Istchee (60). En été, le poisson est la principale source d'aliments traditionnels puisque la chasse est peu pratiquée (60).

Le partage des aliments traditionnels est encore pratiqué et est toujours un aspect très important dans la vie des Cris, même si plusieurs Cris perçoivent une diminution du partage et une augmentation du commerce d'aliments sauvages (60). Une autre valeur importante est de ne pas gaspiller les aliments traditionnels et de tuer seulement si nécessaire. Si cette valeur est non honorée, le chasseur sera perçu comme ayant manqué de respect à l'animal et à l'esprit de l'animal (28).

Tous les aliments « cris », appelés *Eeyou Meechum* (littéralement, « nourriture des Cris »), sont intrinsèquement bons. Ce détail est important, puisque le concept d'aliment mauvais ou dommageable pour la santé n'avait jamais existé chez les Cris (61). Les recommandations nutritionnelles d'aujourd'hui devraient tenir compte de ce point en favorisant la promotion des aliments sains au lieu de décourager la consommation des aliments dommageables. Par contre, les animaux qu'on aurait vus ou qu'on suspecterait de s'être nourris d'ordures (par exemple des goélands, des ours) seront considérés comme impurs et non comestibles (28). Finalement, certaines parties de l'animal sont offertes préférentiellement aux hommes ou aux femmes; par exemple la tête de l'oie sera, en général, réservée aux hommes tandis que les pattes et les ailes aux femmes (28).

Autre point intéressant : il existe une hiérarchie parmi les aliments, certains étant considérés comme « faibles » et d'autres comme « forts » (62). Cette hiérarchie est basée sur le degré de difficulté de la chasse. Par exemple, l'ours fait partie des aliments forts, tandis que la perdrix est considérée comme faible (62). Adelson rapportait que les aliments provenant de l'industrie alimentaire étaient perçus comme polluants et affaiblissants. Selon plusieurs Cris, si ces aliments étaient consommés en trop grande quantité, ils pourraient affecter leur état de santé (28).

2.1.5 Miyupimaatisiiun – santé chez les Cris

Chez les Cris, le concept de santé se nomme *miyupimaatisiiun* (littéralement, « being alive well ») et s'illustre comme étant un équilibre entre le bien-être physique, mental, spirituel et émotionnel (62). La définition de ce concept s'insère dans une vision écologique de la santé. Elle dépasse l'individu et implique une relation saine et respectueuse avec le territoire et les animaux (62). Le *miyupimaatisiiun* est grandement déterminé par la capacité d'une personne à

pouvoir pratiquer ses activités quotidiennes et à maintenir de bonnes relations interpersonnelles (28). L'alimentation traditionnelle, le territoire, les traditions de chasse, les habitudes de vie traditionnelles et l'identité crie sont au centre de cette définition (62). Le concept de *miyupimaatisiiun* implique de manger des aliments « cris » et d'avoir la capacité de poursuivre des activités telles que chasser et pêcher (62). La « Medicine Wheel » est aussi utilisé dans la culture crie. Ses quatre directions incluent : les cycles de la vie, les saisons, les quatre aspects d'un individu – physique, mental, émotionnel et spirituel. Tous les aspects sont égaux et elle nous enseigne que pour atteindre une vie équilibré et complète, nous devons y accorder la même énergie. La « Medicine Wheel » implique aussi un mouvement représenté par plusieurs cycles (63).

2.2 Déterminants de la santé

En 1999, l'Organisation mondiale de la santé (OMS) définissait les déterminants de la santé comme l'ensemble des facteurs personnels, sociaux, économiques et environnementaux qui déterminent l'état de santé des individus ou des populations (64). Ces facteurs sont nombreux et interagissent les uns avec les autres de façon directe ou indirecte (65).

L'Agence de santé publique du Canada propose un modèle de promotion de la santé de la population qui intègre les recommandations de Santé Canada, la charte d'Ottawa et un modèle écologique. On y retrouve les neuf déterminants suivants : « Revenu & situation sociale », « réseaux de soutien social », « niveau d'instruction », « Emploi et conditions de travail », « Environnements physiques », « Patrimoine biologique et génétique », « Habitudes de vie et compétences d'adaptation personnelles », « Développement sain dans l'enfance », et « Services de santé » (66). Il est par ailleurs regrettable que la sécurité alimentaire et

l'alimentation ne soient nommées parmi ces neuf déterminants, ces derniers font probablement implicitement partie « d'environnements physiques » ou de « revenu », mais ils ne sont malheureusement pas nommés explicitement.

2.3 Déterminants des choix alimentaires

Les raisons influençant les choix alimentaires sont multifactorielles. D'ailleurs, la plupart des auteurs reconnaissent le choix alimentaire comme un processus décisionnel personnel, mais l'influence de facteurs externes environnementaux, culturels ou politiques est aussi reconnue (30, 61, 67-69).

Le besoin physiologique de manger est bien sûr à la base de l'acte alimentaire. Nous mangeons afin de nous procurer de l'énergie et des nutriments. Cependant, comment choisissons-nous les aliments que nous consommons? Quels sont les facteurs à la base de nos choix alimentaires ? Les termes utilisés pour nommer ces facteurs varient parfois d'un auteur à l'autre, bien qu'ils soient décrits de façon semblable. Nous tenterons de faire une brève revue des principaux déterminants influençant le choix alimentaire identifiés dans la littérature scientifique. Les principaux déterminants ont été regroupés en 4 catégories : les déterminants individuels, sociaux & culturels, physiques et environnementaux.

Le choix alimentaire est un processus complexe et le degré d'influence de chaque déterminant varie d'une personne à l'autre ou d'une population à l'autre. L'utilisation d'un seul type d'intervention visant à modifier des habitudes alimentaires ne pourrait pas toucher l'ensemble de la population. Il est important d'identifier et d'agir sur plusieurs déterminants à la fois (70, 71).

2.3.1 Déterminants individuels

Les déterminants individuels réfèrent aux caractéristiques physiques individuelles liées à la biologie et la génétique d'une personne. On inclut aussi sous les déterminants individuels les déterminants psychologiques tels que les émotions et croyances personnelles qui guideront le choix alimentaire. Toujours regroupées sous la catégorie déterminants individuels, on retrouve les compétences personnelles et les caractéristiques socio-économiques.

2.3.1.1 Déterminants biologiques et génétiques

Les déterminants biologiques et génétiques réfèrent aux caractéristiques individuelles de chaque individu comme l'âge, le genre, l'origine ethnique mais aussi à la physiologie de l'alimentation tel que la faim, le goût et l'odorat.

Les besoins physiologiques varient selon les caractéristiques de chaque individu, par exemple l'âge ou le genre ont une influence indéniable sur la consommation alimentaire. En général, un homme à des besoins énergétiques plus grands que la femme, il consommera donc de plus grosses portions (72).

Les mécanismes de faim et de satiété jouent aussi un rôle dans le choix alimentaire. Certains chercheurs avancent que les aliments riches en protéines apporteraient une grande sensation de satiété tandis la consommation d'aliments élevés en gras engendrerait une faible sensation de satiété (73). Ainsi, certaines personnes pourraient choisir des aliments riches en protéines afin d'obtenir une sensation de satiété plus satisfaisante.

Les réponses sensitives au goût, à la texture, à l'odeur et à l'apparence peuvent aider à déterminer les préférences alimentaires et les habitudes alimentaires (74, 75). Dès l'enfance, on peut remarquer une préférence innée pour le goût sucré (76). Cependant, les préférences

alimentaires peuvent se transformer au cours d'expériences positives ou négatives (77). Selon le sondage Pan-Européen de 1995-1996, le goût est un facteur qui influence grandement les choix alimentaires (78).

2.3.1.2 Déterminants psychologiques

Sous les déterminants psychologiques ont été regroupés les facteurs reliés au stress, aux émotions et aux croyances de chaque individu.

L'influence du stress sur les choix alimentaires est complexe, elle varie d'un individu à l'autre, en fonction du «stresseur» et des circonstances. En général, les personnes qui expérimentent du stress peuvent manger plus, ou, moins que d'habitude (79). Wardle et al. (2000) rapportaient qu'une personne exposée à un stress prolongé au travail pouvait augmenter son risque de prendre du poids (80).

Les émotions influencent la consommation alimentaire ainsi que les comportements alimentaires. Par exemple, Patel (2001) a démontré que la portion de repas consommé dans un état d'esprit positif ou négatif était significativement plus grande qu'un repas consommé dans un état d'esprit neutre (81). Une personne vivant des émotions négatives pouvait privilégier le choix d'aliments à haute teneur en sucre et en gras (77).

Inversement, la consommation de certains aliments peut engendrer des émotions positives ou négatives. En 2008, Desmet et Schifferstein ont défini différentes sources d'émotions liées aux aliments. La première qu'ils appelèrent « attribut sensoriel », réfère à l'émotion ressentie liée à la qualité de l'aliment. Par exemple : (« *I was bored by the unsalted meal* ».) La deuxième réfère à l'expérience ressentie *(« I was dissatisfied because I was still hungry after eating the dish* »); la troisième aux conséquences anticipées (« *I hope to stay healthy by eating fresh*

vegetables ») et finalement, la dernière réfère à la signification personnelle ou culturelle de l'aliment (« *I was bored by the food that reminded me of boring family lunches* ») (82).

Les perceptions, idéaux, croyances, attitudes et valeurs sont utilisés comme point de référence pour juger ou évaluer et éventuellement guider les choix alimentaires (83). Ces croyances et attitudes sont souvent construites en se basant sur des valeurs culturelles et psychosociales (84). Quelque fois, l'aliment lui-même est considéré sacré ou s'intègre dans un rituel (85). Il peut donc être consommé pour ses propriétés médicinales, spirituelles ou encore symboliser un événement comme le gâteau de fête ou encore constituer un symbole identitaire comme la tourtière pour les habitants du Saguenay.

2.3.1.3 Compétences personnelles

Les compétences personnelles regroupent les connaissances et aptitudes influençant l'individu dans ses choix alimentaires.

En ce qui concerne les choix alimentaires, on attache souvent trop d'importance au niveau de connaissances nutritionnelles. En effet, on peut considérer que le niveau général de connaissances nutritionnelles de la population est assez élevé, mais le manque d'habilité ou de motivation peuvent bloquer le changement d'habitudes (84). En effet, les études montrent que les connaissances en nutrition sont faiblement corrélées à de saines habitudes de vie (86).

Finalement, le manque de temps est fréquemment mentionné comme excuse pour ne pas adopter de saines habitudes de vie (87, 88).

2.3.1.4 Caractéristiques socioéconomiques

Les caractéristiques socioéconomiques couvrent les déterminants tels que scolarité, revenu et occupation qui influencent directement le choix alimentaire.

Selon une étude faite aux États-Unis et dans d'autres pays, le revenu n'influence pas la quantité d'aliments consommés, mais influence le type d'aliments consommés (89).

Dans la littérature scientifique, le niveau d'éducation semble influencer les habitudes alimentaires. Ainsi, les personnes plus instruites consommeraient plus d'aliments sains (90) et vivraient moins d'insécurité alimentaire (91).

2.3.2 Déterminants sociaux et culturels

Il est primordial de reconnaître que les habitudes alimentaires des gens se forgent durant leurs activités quotidiennes lorsqu'ils sont en interaction avec d'autres personnes, en famille, entre amis, collègues de travail ou d'école. Manger implique des choix isolés, guidés par des déterminants individuels. Ces choix individuels sont conditionnés par le contexte dans lequel ils se produisent. (93).

Ainsi, les déterminants sociaux et culturels se rapportent à la culture propre d'une société ainsi qu'à ces normes et valeurs, les pratiques religieuses, la stratification sociale, l'entraide parmi les membres d'une communauté(92).

La culture influence les habitudes alimentaires en termes d'horaire des repas, du choix des aliments et des méthodes de préparation (94). En fait, l'impact de la culture est immense et variée (75). La plupart des gens se basent sur leurs caractéristiques culturelles pour juger si leurs choix alimentaires sont acceptables, en termes de portions, d'aliments, de préparation mais aussi pour baser leur préférences alimentaires (84).

La norme sociale réfère à l'impact qu'une ou plusieurs personnes peuvent avoir sur les habitudes alimentaires, que ce soit de manière directe (achat alimentaire) ou indirecte (apprentissage du comportement alimentaire des pairs), de façon consciente (transfert de

croyance) ou inconsciente. Par exemple, des études montrent que les gens tendent à imiter ou égaler les quantités consommées par les autres (95).

La famille ou le réseau social est reconnu comme ayant une grande influence sur les décisions nutritionnelles (93, 96), souvent parce que la famille et les amis sont de bonnes sources d'encouragement ou de découragement et constituent des modèles (84, 97). En 1998, Sorensen démontra qu'un support social positif de la part des membres de la maison ou des collègues de travail était positivement associé avec une amélioration de la consommation de fruits et légumes. (98). En plus, l'influence des membres de la famille peut déterminer la composition d'un repas; par exemple, une mère de famille voulant faire plaisir à son conjoint pourrait préparer son repas préféré (99).

2.3.3 Déterminants reliés aux milieux de vie

L'environnement alimentaire à l'extérieur de la maison tel qu'au travail, à l'école et au restaurant influence les comportements alimentaires (89). Que ce soit par le type d'aliments disponibles, la taille des portions ou l'accessibilité (89). Les milieux de vie réfèrent aux endroits où les gens vivent, leur milieu de travail, leur épicerie, leur école, leur centre de la petite enfance, leur quartier, leur communauté, leur village (70). Chacun de ces milieux de vie agit sur les individus qui sont exposés à des influences matérielles et sociales. Ces influences peuvent faciliter ou bloquer leurs choix alimentaires. En général, les milieux de vie sont découpés en 5 catégories : le milieu familial, le milieu scolaire, le milieu de la petite enfance, le milieu de travail et la communauté locale (le voisinage) (65).

2.3.3.1 « *Enablers of choice* »

Selon plusieurs études, le prix d'achat des aliments affecte les décisions alimentaires. Il serait le deuxième plus important facteur influençant le choix alimentaire (88, 100).

La disponibilité réfère à la présence des aliments que l'on désire consommée, et ce, dans des conditions acceptables. Par exemple, la non disponibilité, c'est-à-dire l'absence, d'un aliment rendra sa consommation impossible (84). Dans le sondage Pan Européen, la qualité et la fraicheur ont été identifiées comme étant la plus grande influence guidant les choix alimentaires (78, 100).

L'accessibilité physique aux aliments, souvent reliée à la situation géographique, ou le transport disponible est aussi un facteur important (101). Par exemple, l'accessibilité physique à des restaurants où l'on sert généralement des portions plus généreuses et des aliments denses en énergie serait impliquée dans l'épidémie d'obésité (89, 102).

2.3.4 Déterminants environnementaux

Les déterminants environnementaux rassemblent les aspects plus macroscopiques conditionnant le choix alimentaire. Il comprend les politiques, les médias, les facteurs démographiques et économiques, l'environnement naturel et les écosystèmes. Même s'il est difficile de déterminer leurs degrés d'influence, nous savons qu'ils influencent l'ensemble des autres facteurs et ultimement le choix alimentaire (70). Glanz & al. (2005) identifiaient 4 types d'environnements alimentaires; le premier « *Community Nutrition Environment* » étant le nombre, le type, la localisation et la disponibilité des commerces alimentaires comme les restaurants ou épiceries (100). Le deuxième « *Organizational Nutrition Environment* », ce que nous avons nommé plus haut les milieux de vie, tels que la maison, l'école et le travail (100). Le troisième « *Consumer Nutrition Environment* » reflétant l'expérience d'achat du consommateur autour des commerces alimentaires ou des milieux de vie tels que la qualité, le prix et la quantité (100). Et finalement « *informative environment* » constituant les média et publicité ayant la capacité de convaincre et d'influencer la population. (84, 100).

Il est possible d'agir sur ces facteurs afin d'influencer les choix alimentaires en mettant en place des politiques, lois, normes ou programmes gouvernementaux. Les lois et politiques gouvernementales et commerciales sont les stratégies de choix afin de modifier les environnements alimentaires (70).

En conclusion, il existe plusieurs déterminants du choix alimentaire. Tenter de modifier les habitudes alimentaires d'un groupe d'individus est un véritable défi. Différentes stratégies sont requises pour obtenir de bons résultats.

2.3.5 Déterminants du choix d'alimentation traditionnelle chez les peuples des Premières Nations

Selon Young (2003), il semble que la génétique et les contaminants environnementaux aient reçu beaucoup plus d'attention en recherche chez les autochtones que les déterminants sociaux de la santé (103).

En 1996, Kuhnlein et Receveur identifièrent les concepts suivants comme ayant une grande importance dans le processus du choix des aliments traditionnels : la disponibilité et la qualité alimentaire (ex : climat, pollution, survie des espèces, techniques de cueillette), les préférences et les pratiques culturelles (ex : goût et texture des aliments, structure des repas, croyance à propos des aliments et distribution des aliments), l'accessibilité (ex : coût impliqué dans les achats ou la cueillette), l'éducation et les besoins biologiques (ex : âge et genre, niveau d'activité physique et maladies) (30).

Dans les facteurs facilitant la consommation, on retrouve la présence d'un chasseur, trappeur ou pêcheur dans la famille qui semblerait affecter positivement la fréquence et la quantité d'aliments traditionnels consommés (44, 104, 105). L'isolement d'une communauté aurait aussi une influence. Ainsi, plus la communauté est éloignée d'un centre urbain, plus la

consommation d'aliments traditionnels augmenterait (29, 106). Les personnes plus âgées, les hommes de même que les personnes ayant reçu une éducation traditionnelle sembleraient en consommer plus régulièrement (44, 104, 105). Une grande consommation d'aliments traditionnels dans les communautés autochtones serait aussi associée à l'accessibilité d'une variété d'aliments traditionnels frais et à la présence de partage dans la communauté (60, 107, 108).

En 2008, Redwood et al. démontraient qu'il y avait des associations statistiquement significatives entre la consommation d'aliments traditionnels, la pratique d'activité physique, la pratique d'activités culturelles, l'utilisation de la langue autochtone à la maison, l'utilisation de médecine traditionnelle et la participation à des évènements traditionnels (27).

En ce qui concerne les barrières à la consommation, une plus faible consommation a été observée chez les femmes célibataires, divorcées ou veuves ainsi que chez les jeunes femmes (104). La taille des communautés est également une barrière : la consommation d'aliments traditionnels dans les communautés plus peuplées serait moindre puisqu'il y a moins de territoires disponibles, donc moins d'accessibilité aux animaux sauvages (104).

Selon Kuhnlein et Receveur (1996), les facteurs expliquant la faible consommation d'aliments traditionnels résident dans la diminution du transfert de connaissances pratiques pour chasser ainsi que pour préparer et entreposer les aliments traditionnels (30); le temps et l'énergie requis pour participer à des activités traditionnelles (108, 109); ainsi que la précarité de l'environnement (30, 110). Chan et al. (2006) ajoutent que, chez les jeunes, la faible consommation s'explique par l'augmentation des emplois disponibles, qui réduit les occasions de chasser; le manque d'accès à des fonds pour obtenir de l'équipement de chasse et pêche; les

changements en matière de préférences alimentaires; l'absence d'une éducation traditionnelle (106, 111); et le manque d'intérêt pour les activités traditionnelles (104). Les choix alimentaires des jeunes autochtones semblent principalement guidés par la commodité, la disponibilité et le coût des aliments (112). Toutefois, en faisant abstraction du fait que les jeunes générations consomment moins d'aliments traditionnels, plusieurs indications démontrent que les jeunes désirent poursuivre des activités traditionnelles, au moins de façon saisonnière ou à temps partiel (105).

Il existe beaucoup de variations dans la littérature quant au coût abordable ou non des aliments traditionnels. Les études rapportent deux facteurs contradictoires ayant un impact sur leur consommation : d'un côté, la barrière que constitue l'incapacité de payer les frais reliés à la pêche et à la chasse (104, 109, 113); de l'autre, l'incitation à consommer plus d'aliments traditionnels en raison du coût élevé d'un panier d'épicerie dans des communautés nordiques isolées (114).

Selon quelques études, le niveau d'éducation, l'occupation et le statut d'emploi n'ont pas d'influence statistiquement significative sur la consommation d'aliments traditionnels (105, 115). Cependant, d'autres études affirment le contraire (116, 117). De plus, une étude rapportait que les connaissances sur les bienfaits de l'alimentation traditionnelle dans la prévention des maladies chroniques n'avaient pas d'influence sur les choix alimentaires (86).

Les cycles saisonniers influencent les types d'aliments traditionnels consommé (118). Par exemple, l'oie est davantage consommée au printemps, le caribou en hiver et les baies en été. Ainsi la consommation des types d'aliments traditionnels fluctue au fil des saisons, bien que la

présence d'un congélateur dans les maisons en allonge les périodes de consommation (43, 105).

Déterminants chez les Cris

En 2005, Loutit, dans une étude qualitative, demandait aux jeunes de la communauté de Wemindji de s'exprimer sur les raisons pour lesquelles ils appréciaient les aliments traditionnels cris. Il obtint différentes réponses allant des préférences alimentaires, aux valeurs nutritives, à l'importance culturelle, traditionnelle et sociale (119). Certains participants mentionnèrent des barrières à la consommation tel les faible disponibilité, la qualité et le côté peu pratique des aliments traditionnels (119). Dans cette même étude, il posait aux jeunes la question suivante : Si un Cri ne consommait pas d'aliments traditionnels, pourrait-il toujours se considérer comme un Cri? La plupart des jeunes répondirent « oui », en soulignant que l'identité crie allait au-delà de la nourriture que l'on consomme (119). Par contre, la majorité des participants soulignaient l'importance de connaître les techniques traditionnelles de chasse (119).

2.4 Modèles théoriques des déterminants de l'alimentation

Au cours des dernières décennies, plusieurs modèles exploratoires ont été suggérés pour expliquer les choix alimentaires (69, 83, 120). La complexité et les multiples facettes de l'alimentation sont largement reconnues par les chercheurs, qui tentent de regrouper les facteurs en différents sous-groupes. Deux principales catégories semblent ressortir, soit la catégorie des facteurs intra-personnels (physiologie, biologie) (74, 75, 77, 121-124) et celle des facteurs externes (environnement, culture, société, politique) (61, 85, 95, 118, 125, 126).

Afin de bien isoler les origines des choix alimentaires et éventuellement de les influencer, il est nécessaire de porter une attention à ces deux sous-groupes (127).

2.4.1 Modèle écologique

La perspective écologique fait partie de la vision et des pratiques de santé publique depuis ses premiers balbutiements (128, 129). Elle est la combinaison de plusieurs disciplines et théories (130). Dans un modèle écologique, la santé est déterminée par plusieurs niveaux d'influence (131-133). Ainsi, un individu est influencé par sa famille, sa communauté et son environnement; inversement, l'environnement est influencé par chaque individu, chaque famille et chaque communauté (128, 134). Même chose pour les familles et les communautés qui s'inter-influencent et sont influencées par les individus et les environnements (128, 134). Le modèle écologique prend en compte non seulement l'effet isolé de chaque facteur mais aussi l'effet d'interaction que peuvent avoir ces facteurs combinés entre eux (132).

La santé est déterminée par l'interdépendance entre les individus et ses systèmes (128). Le modèle écologique permet de dégager des interventions de promotion et de prévention permettant à chaque individu d'agir sur son propre comportement tout en réduisant leur exposition à des facteurs de risque (128). Il combine des interventions actives, requérant une implication volontaire et soutenue des individus, avec des interventions passives, ne requérant aucune implication (130). Il s'agit d'une grande force du modèle écologique qui dégage des stratégies combinant des interventions aux niveaux individuel et environnemental (132, 134-136). Le modèle écologique propose d'agir sur différents niveaux de facteurs qui dépasseront la simple promotion de l'alimentation traditionnelle, mais iront agir sur la promotion de plusieurs autres déterminants de santé (130). Par exemple, en agissant sur une meilleure accessibilité à la pratique de la chasse, il est probable qu'on contribuera aussi à la promotion

de l'activité physique. Finalement, le modèle écologique aurait comme autre avantage de bien s'appliquer dans un milieu défavorisé (137).

2.4.2 Faiblesse du modèle écologique

Malgré plusieurs avantages, le modèle écologique comprend quelques faiblesses. Parce qu'il est multi niveaux et qu'il génère de nombreux déterminants, il est difficile d'agir sur tous les déterminants (70, 128). La mise en place de différentes interventions sur plusieurs niveaux peut s'avérer fort onéreuse et très difficile à opérationnaliser, requérant une grande coordination au sein des différents groupes impliqués et une excellente connaissance de plusieurs disciplines variées (65, 130). Et comment identifier le facteur qui a le plus d'influence sur la consommation d'aliments traditionnels? (132) Le modèle écologique expose la multitude d'influences liées à un comportement sans indiquer lequel aura plus d'impact. En plus, le modèle écologique ne permet pas de définir jusqu'où la santé publique doit agir, jusqu'où faut-il remonter : par exemple pour contrôler la consommation d'alcool dans une population, faut-il s'adresser à la réduction des inégalités sociales, au racisme ou doit-on plutôt s'attaquer à la disponibilité de l'alcool, à l'industrie ou aux médias? Heureusement, le modèle écologique va plus loin que de blâmer l'individu pour son comportement malsain, il reconnaît l'importante influence des facteurs externes pour lesquels l'individu a peu de pouvoir (93, 132).

En ce qui concerne l'évaluation du modèle écologique, elle demande une connaissance de plusieurs disciplines et une mise en place d'analyses statistiques sophistiquées, telles que les analyses multi-niveaux, ce qui n'est pas à la portée de tous (132). Les interactions complexes entre les niveaux personnel, social, communautaire et environnemental font en sorte qu'il est extrêmement difficile d'isoler l'effet d'une intervention (132). Certains leur reprochent même

de ne pas produire de simples hypothèses qui pourraient être testées. En plus, comment capturer les relations entre niveaux d'influence (132)? Et comment les classer? On s'aperçoit rapidement que le facteur que nous évaluons peut faire partie de plusieurs niveaux d'influence (132). Le choix des indicateurs sera ainsi très ardu et fera difficilement l'unanimité : fera-t-il partie du bon niveau d'influence ? Mesura-t-il le bon concept ? Les critiques sont ainsi quasiment inévitables. Ajoutons à cela la nature dynamique du modèle écologique; comment choisir le meilleur moment pour collecter les données, sachant que le modèle est en constante évolution? Les facteurs sont interdépendants ce qui fait en sorte que si un facteur change, les autres en seront affectés (138). En outre, un même facteur peut faire partie de plusieurs niveaux et un même individu de plusieurs groupes. De surcroît, un individu peut se retirer du groupe, soit disparaître un moment, et y revenir. Par la nature dynamique du modèle, est-il même possible d'en généraliser les résultats? (128) Ainsi, le modèle écologique n'a pas été souvent évalué en raison de la difficulté de contrôler l'effet de l'environnement sur l'individu et vice-versa, mais aussi parce le modèle doit être évalué en entier avec chaque système, requérant beaucoup de connaissances, de temps, d'énergie et d'argent (128).

2.4.3 Choix du cadre conceptuel

Le choix du modèle écologique permet de reconnaître l'étendue que doit couvrir la promotion de l'alimentation traditionnelle afin d'agir efficacement (139). Pour atteindre les personnes les plus vulnérables, qui sont souvent les personnes les plus difficilement joignables par des programmes de promotion, il est nécessaire d'agir en combinant différentes stratégies comportementales, environnementales, organisationnelles et politiques (70, 134). Les futurs programmes de promotion de santé doivent reconnaître les limites des programmes précédents qui se concentraient sur les comportements individuels et adresser d'un point de vue

écologique l'interdépendance entre les multiples déterminants de la santé (134). Il faut toutefois reconnaître que plus le modèle est large, plus il offre des difficultés opérationnelles et d'évaluation et plus il demande un large éventail de ressources.

Un modèle écologique servira de cadre conceptuel pour la sélection des variables prédictives. Les variables indépendantes seront réparties en quatre niveaux : individuel, réseau social, communautaire et environnemental (120, 140, 141). Le grand intérêt de l'utilisation de l'approche écologique dans ce contexte de recherche s'explique par sa possible proximité avec le concept de *miyupimaatisiiun*, le concept de santé pour les Cris. Le *Miyupimaatisiiun* dépasse l'individu et englobe la famille, la communauté et l'environnement. Les anciens disent : « *comment une personne peut être en santé si sa famille, sa communauté ou son environnement sont malades?* » Avec cette vision écologique de la santé, il était nécessaire d'utiliser une perspective écologique pour bien comprendre les facteurs affectant la consommation d'aliments traditionnels.

2.4.4 Définitions des niveaux d'influence

Le niveau individuel réfère aux facteurs biologiques, psychologiques et personnels. Ces influences se rapportant à l'individu peuvent influencer le choix alimentaire à travers des caractéristiques individuelles, connaissances, perception de contrôle, préférences, émotions, etc. Dans le passé, les stratégies de promotion de santé ont souvent mis l'emphase sur ces facteurs (142); aujourd'hui, il est recommandé de prendre en compte les facteurs individuels mais de les placer dans un contexte global.

Le niveau réseaux sociaux réfère en partie aux facteurs reliés aux relations de l'entourage d'un individu. Il inclut les interactions entre les membres de la famille et les amis comme les

encouragements et la pression du groupe. En général, un réseau fort constitué de membre de la famille, d'amis ou de collègues de travail encourage une bonne santé (143).

Le niveau communautaire réfère aux milieux de vie et aux facteurs physiques qui influencent la prise d'aliments traditionnels. En termes de milieux de vie, on peut mentionner l'influence des écoles, du travail, de la municipalité, de l'épicerie, etc. Selon l'OMS

« *Un milieu est l'endroit où les gens vivent, apprennent et travaillent, qui comprend un lieu et son contexte social dans lequel les gens interagissent quotidiennement.* » (65, p.12).

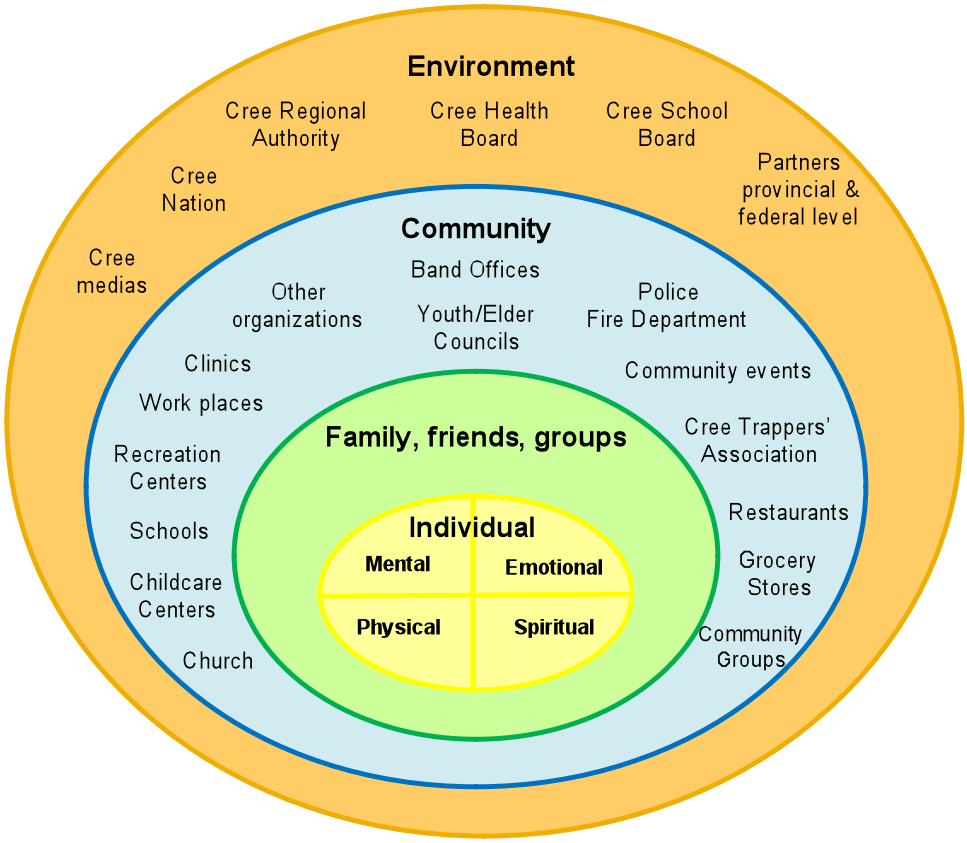
Chaque individu fait partie de plusieurs milieux de vie qui l'influencent de façon sociale mais aussi physique.

Le niveau environnemental joue un rôle plus distal et indirect, mais a un puissant effet sur ce que la population consomme (102). On inclut ici l'écologie, les lois et politiques, etc. Sur le territoire de l'Eeyou Istchee, on peut penser que les organisations suivantes peuvent influencer le niveau environnemental : le grand conseil des Cris, les médias, les partenariats provinciaux et fédéraux.

Les facteurs faisant partie du niveau environnemental s'évaluent souvent de façon qualitative (65) et génèrent souvent des interventions passives de promotion de la santé (130). Ces interventions passives sont souvent plus efficaces sur les individus puisqu'elles ne requièrent aucun investissement de leur part (130).

La Figure 1, p.29, illustre les différentes organisations pouvant influencer la consommation d'aliments traditionnels en Eeyou Istchee. Pour chacun de ces niveaux d'influence, plusieurs facteurs existent, les facteurs interagissent entre eux à tous les niveaux. En plus, un même facteur peut faire partie de plusieurs niveaux à la fois. Ainsi, la catégorisation par niveaux d'influence d'un facteur peut varier d'une situation à l'autre.

Figure 1 Modèle écologique des différentes organisations pouvant influencer la consommation d'aliments traditionnels en Eeyou Istchee



3. Méthodologie du mémoire

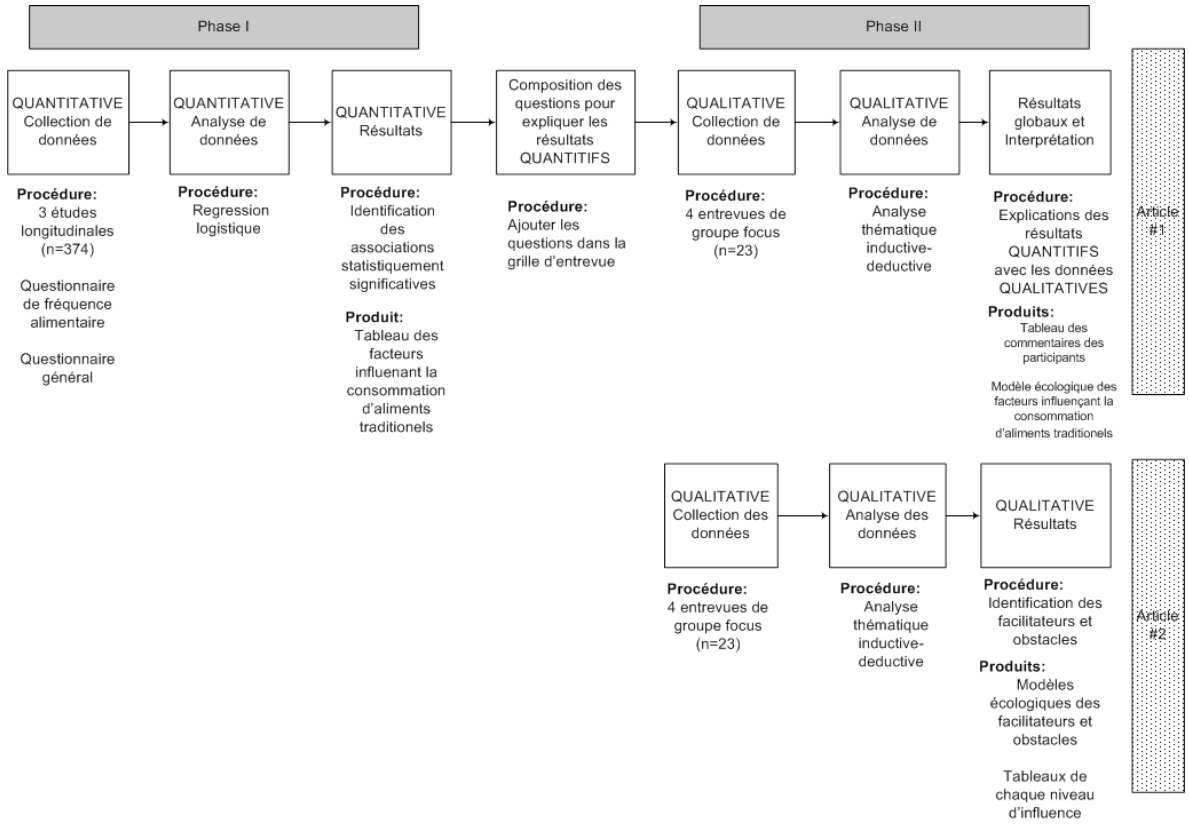
Pour répertorier les facteurs associés à la consommation d'aliments traditionnels chez les Cris, un devis mixte a été utilisé. Deux articles scientifiques ont été rédigés. Le premier article combine, en premier lieu, une analyse secondaire de données, utilisant trois études transversales provenant de l'étude longitudinale « *Multi-Community Environment-and-Health Longitudinal Study in Eeyou Istchee* » menée à Mistissini en 2005 ainsi qu'à Eastmain et Wemindji en 2007. Subséquemment, des groupes focus, menés à Mistissini en 2009, apportent des informations complémentaires pour enrichir, clarifier et contredire les interprétations fondées sur les analyses quantitatives. Creswell appelle cette méthode : *« sequential explanatory mixed methods* » (144, 145) tandis que d'autres l'appellent «*Complementarity : Qualitative follow-up*» (146, 147).

Le deuxième article analyse en profondeur les données provenant des quatre entrevues des groupes focus menés à Mistissini en 2009.

3.1 Déroulement du mémoire

La figure 2 (p.31), illustre les procédures effectuées pour chaque article ainsi que les résultats obtenus. C'est-à-dire que pour le premier article, un tableau des résultats a été produit et pour la régression logistique, un tableau de commentaires des participants et un modèle écologique des facteurs furent créés. Pour le deuxième article, deux modèles écologiques furent produits, l'un pour les facilitateurs, l'autre pour les obstacles, ainsi que 4 tableaux détaillant chaque niveau d'influence des deux modèles écologiques. Plus de détails sur les méthodologies utilisées sont disponibles dans chacun des articles scientifiques.

Figure 2 Diagramme visuel des procédures effectuées pour chaque article scientifique.



L'utilisation dans le premier article d'un devis mixte offre de nombreux avantages (144, 148). Il permet de combiner la force de la recherche qualitative avec la force du quantitatif. En effet, la recherche quantitative est souvent critiquée comme ne tenant pas compte de l'environnement extérieur et l'utilisation de questions fermées ne permet pas d'entendre la voix directe des participants. Tandis que la recherche qualitative permet rarement de généraliser les résultats (148). Ainsi, la combinaison des deux méthodes permet de combler les faiblesses des recherches qualitatives et quantitatives. Pour la présente étude, cette combinaison permet d'interpréter certains résultats obtenus dans l'étude longitudinale.

De plus, le devis mixte permet d'accéder à tous les outils disponibles pour répondre à la question de recherche et permet de répondre à des questions qui ne pourraient être répondues

autrement : par exemple, expliquer les résultats des analyses quantitatives (144). Elle permet de dégager un portrait global du problème avec une compréhension en profondeur de la perspective du participant, tout en permettant de généraliser une partie des données.

3.2 Analyse quantitative – Données manquantes

Pour les données manquantes, nous avons utilisé la technique "*complete case analysis*", où tous les individus avec données incomplètes ont été retirés des analyses. Cette technique assume que les données incomplètes sont aléatoires et n'influencent pas les résultats des analyses. Ainsi, chaque donnée manquante a été évaluée individuellement. Après révision, l'IMC apportait quelques interrogations. En effet, trente-trois données étaient manquantes, laissant penser que certains participants avaient refusé de répondre à cette question, excluant possiblement une catégorie de répondant. Néanmoins, après analyse, sur ce total, vingt-un individus n'avaient pas répondu au "questionnaire individuel" au complet et 5 individus n'avaient répondu à aucune question. Seulement sept individus n'avaient pas répondu à la série de questions reliées au poids, ce qui représente 1,8 % de l'échantillon. Il est certain que ces 7 individus ne sont pas aléatoires, mais puisqu'ils sont un petit nombre, il a été supposé qu'ils n'influençaient pas la variance.

4. Article I

A mixed methods inquiry into the determinants of traditional food consumption among three Cree communities of Eeyou Istchee from an ecological perspective

SHORT Running TITLE
Factors affecting traditional food consumption

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4.1 Abstract

Objective. To identify the factors involved in traditional food choices of Cree aboriginal people living in the Mistissini, Eastmain and Wemindji communities in northern Quebec.

Study design. A mixed methods explanatory design involving focus group interviews to interpret the logistic regression results.

Methods. This study includes a secondary data analysis of a cross-sectional survey of three Cree communities (n=374) and four focus group interviews (n=23). In the first quantitative phase of the study, data was collected using a food-frequency questionnaire along with structured individual questionnaires. Subsequently, the focus group interviews helped explain and build on logistic regression results.

Results. People who consume traditional food three days or more weekly had increased odds to be 40 years old, to walk 30 minutes or more per day, to not have completed schooling, to leave in Mistissini and to be a hunter ($p<0.05$ for all comparisons). Focus group participants provided explanations or contradicted quantitative analysis. For exemple, even if no association were found with employment status, focus group participants believed that employment acts both as a facilitator and as a barrier to traditional food consumption, making the effect undetectable. In addition, focus group participant suggested that traditional food choices are the result of multiple interconnected influences based in individual, family, community and the environment, rather than a single factor.

Conclusion. This study has contributed to existing evidence by bringing to light a number of factors unique to traditional foods that have not previously been researched in detail. Efforts to

promote and sustain traditional food in Cree communities should be maintained to improve overall health and wellbeing.

Keywords: traditional foods, First Nations, ecological perspective, determinants, mixed methods research

4.2 Introduction

Over the last few decades, the Aboriginal peoples of Canada have had a higher incidence of chronic diseases (1), which coincides with the profound changes in their environment, including lifestyle and diet. The Cree diet, which was traditionally based on the consumption of wild animals and fish, is now mainly based on market foods (2). Several studies have reported that the consumption of traditional foods, such as wild animals, fish, birds and berries, is in decline (3). A diet rich in traditional foods has the potential to protect against the risk of chronic disease because of its high levels of protein, quality fats, vitamins and minerals (4, 5).

In 2005, Willows noted the lack of understanding of the determinants of food choices among Aboriginal peoples (6, 7). The reasons influencing food choices are multi-factorial (8, 9) and the few studies that do exist have pointed out some important factors involved in traditional food consumption (6, 10, 11). For example, living in a small and isolated community facilitates consumption (5), as does being an older hunter, being physically active and practicing traditional activities (11-13).

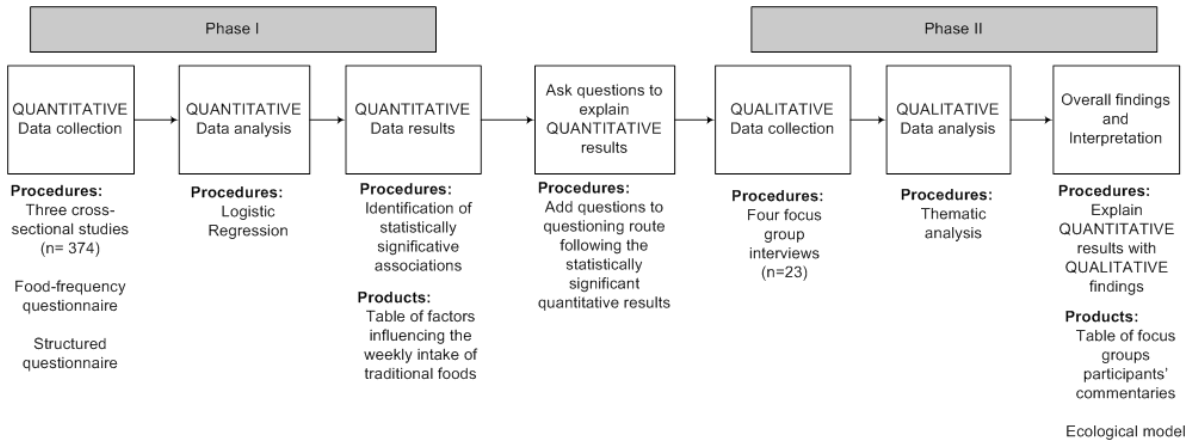
Food choices have been explored in numerous studies, from a wide variety of different disciplines and perspectives (7, 14-17). To help understand the food choice process, several models have been developed (18, 19). However, none of the previous studies have used the ecological model as a way of mapping out factors associated with traditional food consumption. This model suggests that food consumption is not only influenced by individual variables (20), but also by social and environmental factors (21) and their interactions, thus creating different levels of influence (22). Moreover, our choice of an ecological approach is culturally appropriate, as it is in keeping with the Cree concept of health, *miyupimaatisiiun*,

which goes beyond the health of the individual and implies a healthy and respectful relationship with the natural environment and the animals (23). The aim of this study is first to identify, by means of quantitative analysis, the factors associated with traditional food consumption, and second, to help explain these results using the findings obtained through focus group interviews.

4.3 Material and methods

To explore the factors associated with the consumption of traditional foods among the Cree, we used what Creswell calls a "sequential explanatory mixed methods design" (Figure 1) (24, 25). This type of design is used to help explain findings derived from quantitative analyses. In the first phase, quantitative findings were drawn from a secondary analysis of three cross-sectional studies from the *Multi-Community Environment and Health Longitudinal Study in Iyiyuu Aschii* (n=374). The overall methodology of this study is described in detail elsewhere (26, 27). As participant voices were not included, we subsequently used focus group interviews in the second phase of this study to help explain the initial quantitative results.

Figure 1 Visual diagram of the procedures of this sequential explanatory mixed method study



Quantitative Data Collection (Phase I)

In Mistissini (pop. 3000), the data was collected over a period of 2 months during the summer of 2005. Data collections for Eastmain (pop. 500) and Wemindji (pop. 500) were combined over a 2 month period in 2007. These two communities are smaller and more remote than Mistissini, but all three communities are accessible by road.

In total, data from 374 participants, who were between 18 and 90 years old, was analyzed. Each participant was selected randomly. A stratified sampling design was used to sample the population.

To assess traditional food intake, a traditional food-frequency questionnaire covering a one-year period of food consumption was developed in partnership with community members, taking into account seasonal variations and availability (52). The questionnaire was administered by interviewers, who were selected from the community and had received training in interview techniques. The interviews lasted 3 hours and were performed in Cree. During the interviews, food models were used in order to maximize the precision of the answers.

Additional questionnaires were distributed during each interview to gather information about the participants' lifestyles and their levels of physical activity. At the end of the interview, one member of the research team reviewed all the questionnaires. Double verification was carried out on the data transcription.

Quantitative Data Analysis (Phase I)

All analyses were conducted with SPSS software (Statistical Packages for the Social Science v. 16.0); p-values ≤ 0.05 were considered to be statistically significant. Logistic regression

was used to control for confounding (28) and examine the multivariate relationship of traditional food consumption (≤3 times per week) with these predictive variables: Community, Sex, Age, BMI, Smoking Status, Self-reported Health Status, Concerns about Pollution, Employment Status, Education, Practice of Hunting, Daily Walking, English spoken at home, and Number of people living in the household.

Quantitative Variables

The traditional territory of the Cree is called *Eeyou Istchee*, which literally means "Cree Land." Even with its large geographical area, the species of plants and animals available are similar. Adding up all the items of the 5 food groups (game, birds, fish, grease and berries) collected in the traditional food-frequency questionnaires generated an estimate of each person's weekly traditional food consumption frequency. Because the data from the secondary analysis was not available, neither preparation nor cooking methods were taken into consideration. Bannock and tea were not included for the same reason.

The weekly frequency of traditional food consumption variable was dichotomized based on a 2008-2009 public health campaign in Eeyou Istchee, which recommended the consumption of wild animals at least 3 times per week.

An extensive literature review was undertaken to identify factors previously associated with the consumption of traditional food. Those factors most frequently identified in previous studies were selected as independent variables in our analyses. All independent variables were divided into categories. "Age" was dichotomized following previous analyses showing that people over the age of 40 consumed more traditional foods (29). The "BMI" was categorized using the WHO classification (30) and the "Daily Walking" reflected public health

recommendations (31). The "Education" variable represented the highest level of schooling completed, "Hunter" indicated whether or not the participant hunted (regardless of the frequency of hunting activities, ex: once a year or every week), "Smoker" described regular and occasional smokers, "Employed" indicated individuals working full-time, part-time and occasionally. The "English spoken at Home" variable allowed us to distinguish between participants for whom Cree was the primary language of communication and those who spoke both Cree and English regularly.

Qualitative Data Collection (Phase II)

In 2009, four focus groups of 4 to 8 people were organized in Mistissini, for a total of 23 individuals (32). Each group discussion lasted approximately 90 minutes. All focus groups were mixed-gender and were held at the participants' preferred location and time. In order to increase participant similarity and to create a more comfortable environment for participants to share, a homogenization sample strategy was used by dividing the participants into two groups of people between the ages of 18 and 40 and two groups of people between the ages of 40 and 90 (32). Participants were selected through a mixture of nomination (32) and snowball recruitment techniques. Previous participation in the *Multi-Community Environment and Health Longitudinal Study* was not required.

All discussions and interviews were held in English and/or Cree, and a Cree interpreter was used when necessary.

Following Krueger's recommendations, a questioning route was developed and pre-tested (Table I), using open-ended questions designed to be short, clear, simple and one-dimensional (32).

Table I Questioning route

This focus group is about exploring facilitators and obstacles that influence traditional food consumption.

1. Following statistical analysis: *(visual support: Simplified results table)*
    a. What do you think of these factors? Do you agree with our findings? Can you explain how they might have an influence?
    b. What do you think of the factors that seem not to be linked? Do you agree?
    c. Can you think of other factors that influence traditional food intake?
2. Is there anything you would like to add?

Focus Group Data Analysis (Phase II)

Each focus group discussion was recorded and then transcribed by an external transcriber, and closely revised by the moderator. Initially, major themes were manually organized and categorized into levels of influence in the ecological model. However, to ensure better data management, QDA Miner 3.2 software (Provalis research, Montreal) was subsequently used to code and organize the transcribed data into factors. The use of computer software allowed a process of iterative coding decisions and highlighted any inconsistencies. It also made the coding system updates or modifications easier (32). The open coding process assigned sentences and/or paragraphs to a factor. Then, in an iterative process, each factor was revisited and, if necessary, moved to another level or merged/divided into different factors. Focus group participants identified and classified different types of influences, but the final classification and naming was performed by us. To ensure validity, the results were presented to a group of community representatives.

The Cree Board of Health and Social Services of James Bay, the research ethics committee of the University of Montreal, and Band Councils approved the study protocol. All participants provided informed consent before participating in the study.

4.4 Results

Logistic Regression (Phase I)

Table II presents a full logistic regression model that summarizes the associations tested.

Table II Factors influencing traditional food weekly intake (<3 days/ ≥3 days): a logistic regression (n= 374)

		≥3 days /week	Crude OR	CI 95%	Adjust[1] OR	CI 95 %
Age	18-39 (n=235)	26.0 %	1.00		1.00	
	40-90 (n=139)	65.5 %	**5.41**	**3.43, 8.53**	**4.51**	**2.47, 8.26**
Sex	Male (n=150)	48.7 %	1.00		1.00	
	Female (n=224)	35.3 %	**0.58**	**0.38, 0.88**	1.10	0.50, 2.40
BMI	18.5 –24.99 (n=27)	37.0 %	1.00		1.00	
	25 – 29.99 (n= 86)	37.2 %	1.01	0.41, 2.47	0.64	0.22, 1.81
	30 and + (n= 261)	42.1 %	1.24	0.55, 2.81	1.08	0.42, 2.80
Daily walking	Less than 30 minutes (n=174)	35.1 %	1.00		1.00	
	30 minutes or more (n=200)	45.5 %	**1.55**	**1.02, 2.35**	**2.41**	**1.40, 4.13**
Education	College/ University (n=79)	34.3 %	1.00		1.00	
	High school (n=220)	30.0 %	0.83	0.48, 1.43	0.87	0.45, 1.69
	No formal schooling/elementary school (n=75)	78.7 %	**7.10**	**3.45, 14.62**	**5.53**	**2.20, 13.89**
Hunter	No (n=194)	28.9 %	1.00		1.00	
	Yes (n=180)	53.3 %	**2.83**	**1.84, 4.32**	**3.86**	**1.78, 8.39**
Smoking	Smoker (n=187)	30.5 %	1.00		1.00	
	Non Smoker (n=187)	50.8 %	**2.36**	**1.54, 3.60**	1.15	0.65, 2.02
Employment Status	Employed (n=255)	34.9 %	1.00		1.00	
	Unemployed (n=119)	52.9 %	**2.10**	**1.35, 3.27**	1.17	0.63, 2.17
Health Perception	Fair to poor (n=100)	46. 0 %	1.00		1.00	
	Good (n=176)	37.5 %	0.70	0.43, 1.16	0.60	0.31, 1.15
	Very good to Excellent (n=98)	40.8 %	0.81	0.46, 1.42	0.71	0.34, 1.49
Worries about Pollution	Very much (n=122)	36.0 %	1.00		1.00	
	Somewhat to fairly (n=166)	44.0 %	1.21	0.75, 1.95	1.30	0.70, 2.41
	Not at all (n=86)	39.3 %	0.87	0.49, 1.54	0.72	0.33, 1.58
English spoken at Home	No English (n=187)	44.9 %	1.00		1.00	
	English (n=187)	36.4 %	0.70	0.46, 1.06	1.12	0.64, 1.96
No. of people in the household	1 to 4 persons (n=159)	43.4 %	1.00		1.00	
	5 persons or more (n=215)	38.6 %	0.82	0.54, 1.24	1.45	0.84, 2.50
Community	Eastmain (n=92)	26.1 %	1.00		1.00	
	Wemindji (n=126)	36.5 %	1.63	0.90, 2.94	1.58	0.75, 3.32
	Mistissini (n=156)	52.6 %	**3.14**	**1.79, 5.50**	**3.62**	**1.78, 7.36**

[1]All variables included

As shown in Table II there are positive associations between the consumption of traditional foods and the Age, Daily Walking, Education, Hunters and Community variables ($p<0.05$ for all comparisons).

People who reported consuming traditional foods 3 days or more per week were have increased odds to be 40-90 years old, to walk 30 minutes or more per day, to not have completed any schooling, to be hunters, and to live in Mistissini than those who consumed less traditional foods ($p<0.05$ for all comparisons). No associations were found with Sex, BMI, Smoking, Employment Status, Health Perception, Worries about Pollution, English spoken at Home, or the Number of people in the household after adjusting for other variables.

According to the Hosmer-Lemeshow statistic, this model shows no evidence of a lack of fit (chi-square 3.246, df 8, $p=0.918$). Nagelkerke R^2 is 0.43.

Further bivariate chi-square analyses between independent variables showed collinearity between the "Hunter" and "Sex" variables: 92 % of males were hunters and 81.2 % of females were non-hunters ($p<0.001$, data not shown). In addition, "Age" acted as confounding for few variables, for example 69.4 % of people aged less than 40 attended high school, whereas this was the case for only 41 % of people over 40 ($p<0.001$, data not shown). Also 64.7 % of smokers were younger than 40 and 74.8 % of non-smokers were over 40 ($p<0.001$, data not shown). As for employment status, for people under 40 years of age, 26.4 % were unemployed and 73.6 % were employed ($p<0.001$, data not shown). We also found that the consumption of fish and game is significantly greater in the community of Mistissini ($p<0.001$, data not shown).

Focus Group Interviews (Phase II)

In general, when presented with our statistical results, focus group participants agreed with the findings we obtained through quantitative analyses. For example, participants agreed that age, being a hunter, walking daily and the level of education influenced traditional food intake.

However, they were surprised to learn that residents of Mistissini consumed more traditional foods than those from Wemindji and Eastmain, because they believed that living in an isolated community and having limited access to market foods would be strong facilitators of traditional food consumption. Similarly, focus group participants disagreed with the "non-association" finding between the consumption of traditional food and employment status. According to participants, employment acts both as a facilitator and as a barrier to traditional food consumption. Table III provides more participants' explanations on our quantitative findings.

Table III Focus groups participants' commentaries on quantitative findings

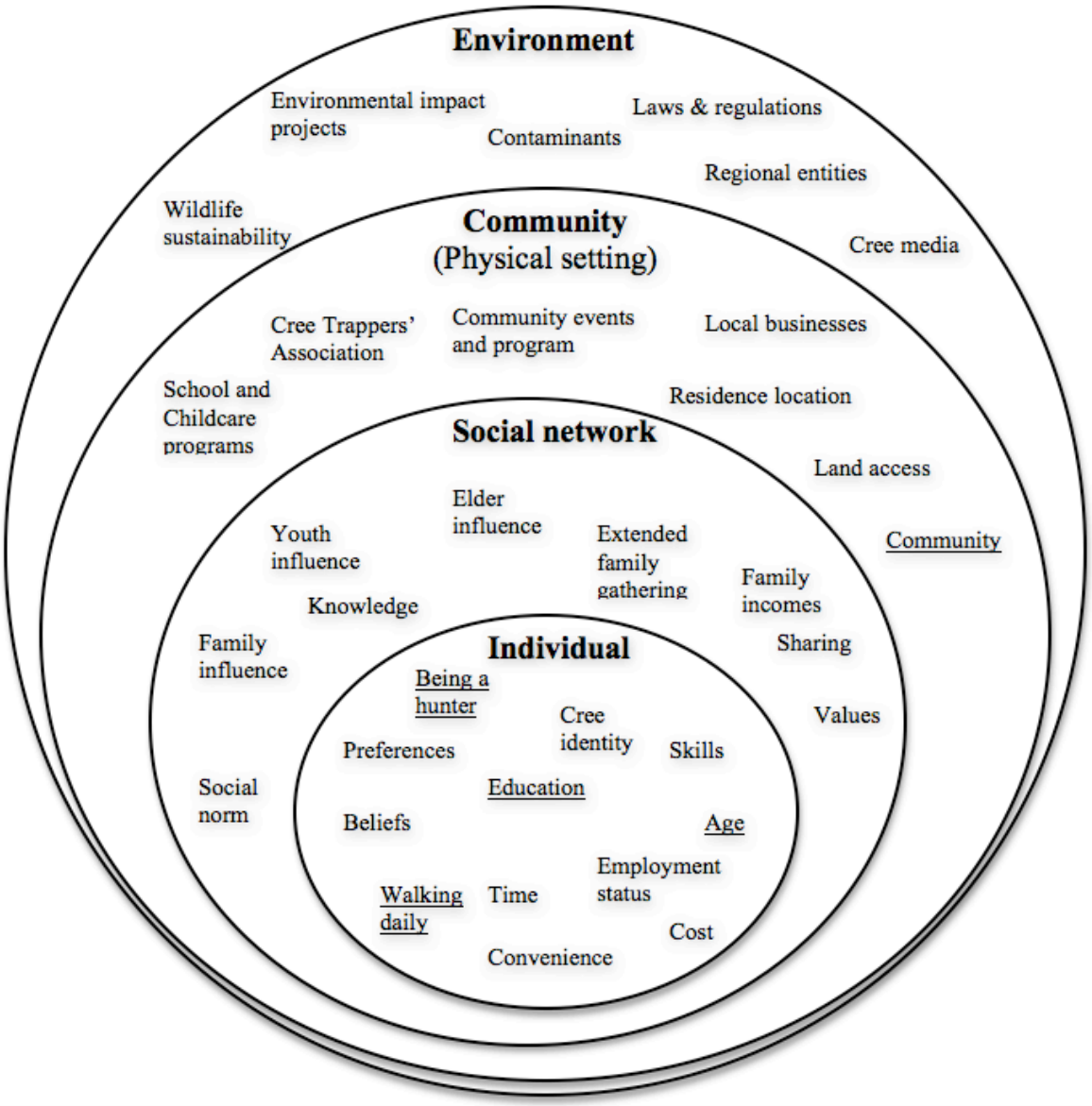
Variables	Participant's explanations	Quotations
BMI	Participants **disagreed** with the non-association 1. People with a higher BMI might be eating high-fat traditional foods, such as bear grease, or using high-fat cooking methods. 2. People with normal BMI use healthy cooking methods and eat less junk food. 3. People with higher BMI eat bigger portions	*1. "I guess those people who are obese; they eat more, more greasy food. Bear fat. Siikusakin (bear fat cracklings) that's really delicious."* *2."Because we don't know the non obese and the obese people like are the non obese people cooking more nutritional foods or adapting to new ways or the obese still practicing what we had in the past, that we don't really know. and the people that are obese, they still going to Kentucky Fried Chicken or the people that are non obese are they still doing the same"* *3. "Big people serve themselves big portions. Like when I go over to Murray's lodge, these people that are big, they get a whole portion - almost double of what the smaller person is eating. And yet they would eat all of it."*
Education	Participants **agreed** with the association. People with more education had to study outside the community, where they had less access to traditional foods and as a result their traditional knowledge or habits were altered	*"They probably live the lifestyle of White people. They have more education so they don't care about the traditional Cree food."*
Employment Status	Participants **disagreed** with the non-association. 1. Having a job provides the means to pay for expenses related to hunting. However, being employed means you have less time to hunt. 2. People with a job tend to stay in the community while the unemployed live in the bush.	*1."Those who are non-employ, where they get their money to get their bush food and those who are employed may have the money but they don't have the time"* *2. "I don't know if I would agree because people that are employed tend to stay in their home in the community, Yah. More than the non employed. Yup. And the non employed Cree trappers. They live in the bush"*
Health Perception	1-2. Some participants **disagreed** with the way the question was phrased stating that the definition of health can vary from one individual to another. 2-3. Some participants **agreed** with the non-association	*1. "Even people that are healthy can feel unhealthy. "* *2. "whether you feel healthy or not it depends on what you eat so you might feel healthy because you eat traditional food all the time and some of us might feel different because we mostly eat commercial food"* *3. "Yeah. I'm not healthy but I still eat beaver, goose, and moose meat. It's healing for the elders, like when they're sick in the hospital; usually the doctors encourage them to eat traditional food. So, being healthy doesn't have to go with eating traditional food "*
Worries about Pollution	1. Some participants **disagreed** with the non-association 2. Some participants **agreed** saying that they were not worried about contaminants because	*1. "I don't know anybody that would not worry about it. That's why I'm stuck with this question. I don't know anybody who would not worry about contaminated food. That's inevitable."* *2. "Myself I don't usually listen to that, you know. If I get a lake*

	they were not listening to the awareness campaign	*trout; I'll eat it (laughing). I won't pay any attention, you know. I won't follow to have it once a week or once a month the way they recommend we do, you know (laughing).”*
Community	1-2.Participants were **surprised** because Wemindji and Eastmain are more isolated than Mistissini, so they should be less influenced by non-aboriginal culture and the price of market foods should be higher; representing incentives to traditional food consumption. 3. Participant tried to explained the result: Presence of programs promoting traditional food in Mistissini	*1. “I am surprised because they're more isolated. And they have less access to restaurant foods. The towns are more far away than us. We were exposed more to the Southern people than them.”* *2.“They are isolated but their(market) food is more expensive”* *3.“I thing the other thing too in Mistissini is having those programs there Murray's lodge and the elder's point there having those program will help, having people eating traditional food because they can go, you know to Murray's lodge or somewhere”*

In addition, participants provided additional information on the factors influencing traditional food consumption. Whereas the quantitative analyses focused largely on individual-level factors, focus group participants identified a number of social- and environmental-level factors. Factors named most frequently by participants were the powerful influence of peers on food consumption, as well as factors related to projects with an environmental impact, wildlife sustainability, and governmental laws and regulations.

Figure 2 presents an ecological model of all factors associated with traditional food consumption identified in the focus group analysis. Four levels of influence are illustrated: environment, community, social network and individual. This model outlines factors associated with traditional food consumption, but the degree of influence of each factor varies from one person to another. The boundaries between levels of influence are highly permeable, as the relationships and interactions between individuals, groups, and their environments are complex.

Figure 2 An ecological model of factors influencing the consumption of traditional food



4.5 Discussion

This study contributes to the scientific literature by confirming the influence of certain individual-level factors on traditional food consumption and by presenting Cree participants' explanations on the impact of these factors -- and others -- on their food choices. The explanations of the Cree participants are consistent with the ecological model, which suggests

that factors involved in food choices are not only related to the individual, but also to his/her social network, community, and broader environment.

Our results are concordant with many studies showing that the presence of a hunter, a trapper, or a fisherman in the family has a positive effect on the frequency and quantity of bush food that is consumed (11, 12, 33). Others have found that older people consume more traditional foods than younger people (11, 12, 33). Some of the older Cree were raised in the bush, where they were exposed to traditional foods and learned traditional skills at an early age. The settlement of Cree communities only happened 35 years ago with the signature of the James Bay agreement, and younger people have been less exposed to traditional foods and lifestyle. Some studies also reported that men consumed more traditional foods than women (34). We suggest that future studies control either for the Sex variable or the Hunter variable, which shows a strong collinearity in our analysis.

In our study, physically active people were found to have increased odds to consume traditional foods 3 days or more per week. Few articles have demonstrated this relationship. However, because the design of the study is cross-sectional, we are unable to establish a temporal relationship between traditional food consumption and walking (35). It is therefore impossible to determine whether being physically active favours the consumption of traditional foods or whether the desire to consume traditional foods is independently associated with physical activity. The adoption of a holistic balanced lifestyle, which includes physical activity and healthy eating, may positively influence the consumption of traditional foods; however, hunting, trapping, collecting, and preparing traditional foods requires a lot of walking.

Although other studies have similarly failed to find a relationship between BMI and traditional food consumption, one might expect to see a relation between normal BMI and high consumption of traditional foods. Focus group participants suggested that people with a higher BMI could be choosing high-fat traditional foods, such as bear grease; eating bigger portions; or using high-fat cooking methods. This highlights the importance of the type of food consumed and the cooking techniques, rather than the frequency of traditional food consumption. Additionally, the extent to which traditional food items displace commercial foods is unknown, which represents a limitation of the study.

Although a relationship between the consumption of traditional food and the level of education was not found in previous studies (33, 36), our results agree with the findings of Hopping & al. that a person with no formal schooling is much more likely to consume traditional foods (37). Along with the focus group participants' explanations, this could be due to their exposure to traditional aboriginal education, which has been shown to promote traditional food consumption (11, 12, 33).

Similar to Batal's 2001 study, the crude odds ratio for the employment status was statistically associated with traditional food consumption (38). However, as in Wein's 1991 study, after being fitted into the model, no association was found, (33). According to focus group participants, income generated through employment can help to cover expenses associated with hunting, but employment reduces the time available for hunting. Maybe, income and time cancel each other out in such a way that there is no detectable association between employment and traditional food consumption in the logistic regression (23). In this example, qualitative findings contradict quantitative findings. Therefore, more research is needed in

order to draw a conclusion on whether or not employment has an effect on traditional food consumption.

Mistissini, the largest and least remote community of the three included in this study, was the community with the highest traditional food consumption. This finding is in opposition to previous studies that have found an association between community size or remoteness and traditional food consumption. For example, in 2006, Chan noted that in bigger communities, traditional foods were sometimes less available because of limited access to hunting territories (11). Other studies have found that community isolation is associated with more frequent consumption of bush food, and in larger quantities (5, 11, 12, 33, 34). Because Wemindji and Eastmain have less access to restaurants, are less influenced by non-aboriginal foods, and store-bought foods are more expensive in these communities than in Mistissini, it was very surprising to find such a result. Focus group participants suggested that the presence of different promotional programs, organized by the Mistissini Band Council to promote traditional food consumption, could explain this result. During winter and summer, the community offers free traditional food meals to the entire community four times a week. Meals are served in a traditional camp setting where elders teach others how to prepare traditional food and make traditional goods such as snowshoes, moccasins, etc. It would be interesting to measure the influence of such programs in future studies.

When we looked closely at the traditional food data, we also found that the consumption of fish and game was significantly greater in the community of Mistissini ($p<0.001$, data not shown). Mistissini is located on the shore of one of the biggest freshwater lakes of Quebec, whereas Eastmain is located on a river modified by hydroelectric development projects. Furthermore, the residents of Eastmain and Wemindji mainly fish in the James Bay, which

requires skill and experience because of the changing tides, climatic conditions, ocean currents, etc. The access to a freshwater lake, where the practice of fishing is easier, may account for the higher consumption of fish in Mistissini. As for the higher consumption of game, it could be explained by greater accessibility to moose in the southern region where Mistissini is located. This may indicate that greater access to a variety of traditional foods increases the frequency of its consumption. A final hypothesis is that wild animals could have been more available in 2005 than 2007.

Limitations

Limitations have been identified for some independent variables. First of all, we predicted that the consumption of traditional foods would be associated with an increased feeling of health and well-being, because traditional foods are an integral part of "*miyupimaatisiiun*" (Wellbeing) (23). However, no association was found probably due to variations in the meaning of "health" for Crees and researchers. In future studies, questions related to the feeling of health and well-being should be culturally adapted and this meaning should also be explored. Second, we expected to find a relationship between the worry about pollution and traditional foods, but we did not find one. Public awareness campaigns have been running over the last 30 years, warning against contaminants found in fish and animal organs. Maybe no association was found because the traditional food categories include all types of wild animals. Future studies could explore this association by using only wild animals affected by contaminants.

Likewise, because the data was taken from a cross-sectional study, the associations found in the study cannot be used to infer a causal relationship (35). Errors may also have occurred

during the collection of quantitative data. It is possible that the long duration of the interviews may have caused a measurement error, leading to the attenuation of the odds ratio. However, the questions used for our research were asked at the beginning of the interview. A limitation associated with the use of food-frequency questionnaires is that they depend on the accuracy of the participants' recall and self-reporting. Not only must participants recall their eating habits over a 12-month period, but they must also provide the "usual" amounts eaten and the "usual frequencies of eating each food."

Unfortunately, focus groups were only organized in Mistissini. It would have been interesting to also gather the points of view of Eastmain and Wemindji residents. However, we took several steps in our methodology to ensure the validity of our focus group results. We pilot-tested the question grid, and we listened to participants and asked them to clarify areas of ambiguity. We created an environment where they could share freely. We used an appropriate moderator. We used systemic analysis procedures and followed accepted protocols to ensure that results were trustworthy and accurate. The qualitative data and their analysis refined and explained the statistical results by exploring participants' views in more depth. The collection of both quantitative and qualitative data brought together the strengths of both forms of research (24).

4.6 Conclusion

This study represents an initial exploration of factors influencing traditional food consumption using the ecological model, which requires further investigation. Nevertheless, we believe that our findings can be used to design traditional food promotion strategies for the Cree of northern Quebec and other nations to improve their overall wellness.

Acknowledgements

Thanks to all the participants from Mistissini, Eastmain and Wemindji communities, who generously shared their views and experiences. We are also grateful to the Cree Board of Health for their strong collaboration and for providing funding for this research, as well as access to the *Environment and Health Longitudinal Study*. Finally, thanks to the Cree Nation of Mistissini, Eastmain and Wemindji for their support.

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5. Article II

Facilitators and barriers to traditional food consumption in the Cree community of Mistissini, Northern Quebec.

SHORT Running TITLE
Facilitators and Obstacles to the Consumption of Traditional Food

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5.1 Abstract

The purpose of this study is to identify barriers to traditional food consumption and factors that facilitate it among the Cree community of Mistissini, according to four levels of influence: the individual, social network, community and environmental levels. A series of four focus groups was conducted with a total of 23 people.

Two ecological models were created, one for facilitating factors and a second for obstacles, illustrating the role of numerous interconnected influences of traditional food consumption. Among those factors environmental impacts project, laws & regulation, local businesses, traditional knowledge, youth influence, employment status and non-convenience of traditional food were named as factors influencing traditional food consumption. The obstacles and facilitating factors identified in this study can be used by political and public health organizations to promote traditional food and more emphasis should be laid down on community and environmental strategies.

Keywords: traditional foods, Native American Indian, ecological perspective, determinants, focus group

5.2 Introduction

Over the last 50 years, the Aboriginal peoples of Canada have been affected by an important increase in chronic diseases such as diabetes (Health Canada, 2004). At the same time, the diet of many Aboriginal peoples has altered drastically: traditionally based on the consumption of wild animals and plants, it is now mainly based on market foods (Kuhnlein et al. 2008). A rapid decrease in traditional food consumption over time has been widely documented in the literature (Nakano, Fediuk, Kassi, and Kuhnlein 2005; Kuhnlein et al. 2004). This decrease is considered harmful to the population's health, as traditional foods have been shown to reduce the risk of developing chronic diseases (Nakano, Fediuk, Kassi, and Kuhnlein 2005; Kuhnlein et al. 2004; Kuhnlein and Receveur 1996; Receveur, Boulay, and Kuhnlein 1997). It appears that consuming as little as 5% of the total daily energy intake in the form of traditional foods would significantly increase the consumption of vitamin A, protein, iron, zinc, copper, magnesium, phosphorus, potassium and vitamin E (Nakano, Fediuk, Kassi, and Kuhnlein 2005). Eating traditional foods can also help reduce the intake of sucrose and saturated fats (Nakano, Fediuk, Kassi, and Kuhnlein 2005; Kuhnlein et al. 2004; Ballew et al. 2006). Beyond their nutritional benefits, traditional foods contribute to supporting the cultural, social, spiritual and economic health of Aboriginal communities (Van Oostdam et al. 2003).

In 2000, Kuhnlein and Chan defined the traditional food system as being

"all of the food species that are available to a particular culture from local natural resources and the accepted patterns for their use within that culture. This term also embraces an understanding of the socio-cultural meanings given to these foods, their acquisition, and their processing: the chemical composition of these foods; the way each food is used by age and gender groups within a selected culture; and the nutrition and health consequences of all these factors for those who consume these foods"(Kuhnlein and Chan 2000).

Many factors influence food choices, (Raine 2005; Sallis and Glanz 2009) and previous studies have pointed out some important factors involved in traditional food consumption (Kuhnlein and Receveur 1996; Willows 2005; Chan et al. 2006). It has been established that living in small, isolated communities facilitates this type of consumption, (Nakano, Fediuk, Kassi, and Kuhnlein 2005; Chan et al. 2006) and that being an older hunter, being physically active, and practicing traditional activities increases the likelihood of consuming traditional foods (Chan et al. 2006; Receveur, Boulay, and Kuhnlein 1997; Redwood et al. 2008). Conversely, a decrease in the possession or transmission of knowledge related to hunting, preparing, and storing traditional foods negatively affects its consumption (Kuhnlein and Receveur 1996; Chan et al. 2006). Other obstacles are: the time and energy required (Kuhnlein and Receveur 1996; Skinner, Hanning, and Tsuji 2006; Mead et al. 2010); environmental changes (Kuhnlein and Receveur 1996) ; increased employment opportunities (Chan et al. 2006); the reduction of hunting opportunities (Chan et al. 2006); shifts in food preferences (Chan et al. 2006); lack of interest in traditional activities (Chan et al. 2006); and lack of equipment or funds (Chan et al. 2006; Mead et al. 2010). With regard to the cost of traditional foods, research findings are contradictory; while some studies argue that hunting and fishing expenses represent an obstacle (Lambden et al. 2006; Chan et al. 2006), others contend that the cost of a food basket in isolated communities is very high and traditional food is cheaper, thus creating an incentive for its consumption (Wein 1994). One study found that education, occupation and job status do not have a significant influence on traditional food consumption (Wein, Sabry, and Evers 1991), whereas other studies have reported the opposite (Batal 2001; Hopping et al. 2010).

Many studies have explored aspects of food choice from a wide variety of disciplines and perspectives, and several models have been developed to help understand the process of food choice (Glanz and Mullis 1988; Furst et al. 1996; Wetter et al. 2001; Story et al. 2008). However, few studies have mapped environmental and individual influences using the ecological model, and those that have employed this model have examined food choices in the general population (Story et al. 2008). This study aims to develop a comprehensive ecological model of traditional food consumption in an Aboriginal community setting. The ecological model suggests that traditional food consumption is not only influenced by individual behaviours (Delormier, Frohlich, and Potvin 2009), but also by social, community and environmental factors (Sobal, Kettel Khan, and Bisogni 1998). The model consists of a series of concentric circles or levels of influence, which illustrate different factors influencing an individual's food choices. Such a framework describes the pattern of interactions between the individual, his social network, and the environment or setting. In addition, our choice of an ecological approach is culturally appropriate as it is in keeping with the Cree concept of health, *miyupimaatisiiun*, which goes beyond the health of the individual and implies a healthy and respectful relationship with the territory and the animals (Adelson 2000).

The purpose of this study is to identify the obstacles and factors that facilitate traditional food consumption among the Cree community of Mistissini in northern Quebec, according to four levels of influence: individual, social network, community and environmental. This model is intended to expand our understanding of factors related to traditional food consumption and place these factors in the context of other influences on health. The modeling of these facilitators and obstacles is an important step towards the development of strategies to increase the proportion of traditional food consumed regularly.

5.3 Methods

A focus group approach was employed to gain a better understanding of what Cree perspectives influence traditional food choices (obstacles and facilitators) (Krueger and Casey 2009). Participants were Mistissini residents aged between 18 and 90. Focus groups are a form of group interviews that capitalize on communications between the participants (Kitzinger 2000) and facilitate the collection of data in a more natural environment where individuals are influenced by others (Krueger and Casey 2009). The objective of focus groups is to allow participants to clarify and explore their own points of view by comparing them to the opinions of others (Kitzinger 1994; Kitzinger 2000). They also allow participants to generate their own opinions in line with their social standards and cultural values (Kitzinger 2000). Ideally, groups should be small enough to allow every individual to express their ideas, but sufficiently large to collect diverse and interesting information (Weber 1990; Krueger and Casey 2009). Groups should be relatively homogenous in order to facilitate discussion, the sharing of opinions, and the identification of points of consensus (Lehoux 2008).

Focus group data collection and recruitment

Following Krueger's recommendations, focus groups were organized and composed of four to eight people, for a total of 23 participants (Krueger and Casey 2009). After the last focus groups, no new information was gained and it was decided that theoretical saturation was reached. Each group discussion lasted approximately 90 minutes. All focus groups were mixed-gender, at the participants' request, and were held at the participants' preferred location and time. In order to increase participant similarity and to create a more comfortable

environment, a homogenization sample strategy was used to divide the participants into two groups of 18-to-40 year olds and two groups of 40-to-90 year olds (Krueger and Casey 2009). Participants were selected through a combination of nomination (Krueger and Casey 2009) and snowball recruitment techniques. All discussions and interviews were held in English and/or Cree, and a Cree interpreter was used when necessary.

A discussion schedule (Table 1) was developed and pre-tested (Nakano, Fediuk, Kassi, and Kuhnlein 2005; Kuhnlein et al. 2004) with open-ended questions designed to be short, clear, simple and one-dimensional (Krueger and Casey 2009).

Table 1 Discussion Schedule

This focus group is about exploring facilitators and obstacles that influence traditional food consumption.

1. What makes you eat traditional food? *(visual support : ecological model)*
    a. In your family
        i. What may make you eat more traditional food?
        ii. What keeps you from eating traditional food?
    b. In your community
        i. What may make you eat more traditional food?
        ii. What keeps you from eating traditional food?
    c. In the Cree Nation
        i. What may make you eat more traditional food?
        ii. What keeps you from eating traditional food?
2. Is there anything you would like to add?

Focus group data analysis

A deductive-inductive thematic analysis with a contextualist perspective was used to analyze the data collected from the interviews. Deductive because the ecological model was used as a theoretical background and factors were selected to answer a specific research question (Braun and Clarke 2006). Inductive because factors are data-driven and not pre-determined to fit

specific factors of the ecological model (Braun and Clarke 2006). Contextualist because of how traditional food choices are influenced by a range of facilitators and obstacles within the society (Braun and Clarke 2006). Each focus group discussion was recorded and then transcribed by an external transcriber, and was closely revised by the moderator. Initially, major themes were organized and categorized manually into the ecological model levels. However, in order to ensure better data management, QDA Miner 3.2 software (Provalis research, Montreal) was subsequently used to code and organize the transcribed data into factors. The use of computer software facilitated the iterative coding process and highlighted inconsistencies. It also made coding updates or modifications easier (Krueger and Casey 2009).

The open coding process assigned sentences and/or paragraphs to a factor. Those factors were organized into four ecological levels, following either a thematic analysis or the participants' classifications during focus groups (an example of an ecological model, with its four levels of influence, was provided as a visual aid). Then, in an iterative process, each factor was revisited or merged or divided into different factors. Then, facilitators and obstacles were extracted from each factor. Finally, factors, facilitators and obstacles were named and defined. Focus group participants identified and classified different types of influences, but the final classification and naming was performed by us. To ensure validity, the results were later presented to a group of community representatives.

The Cree Board of Health and Social Services of James Bay, the research ethics committee of the Université de Montréal and the Mistissini Band Council approved the study protocol. All participants provided informed consent before participating in the study.

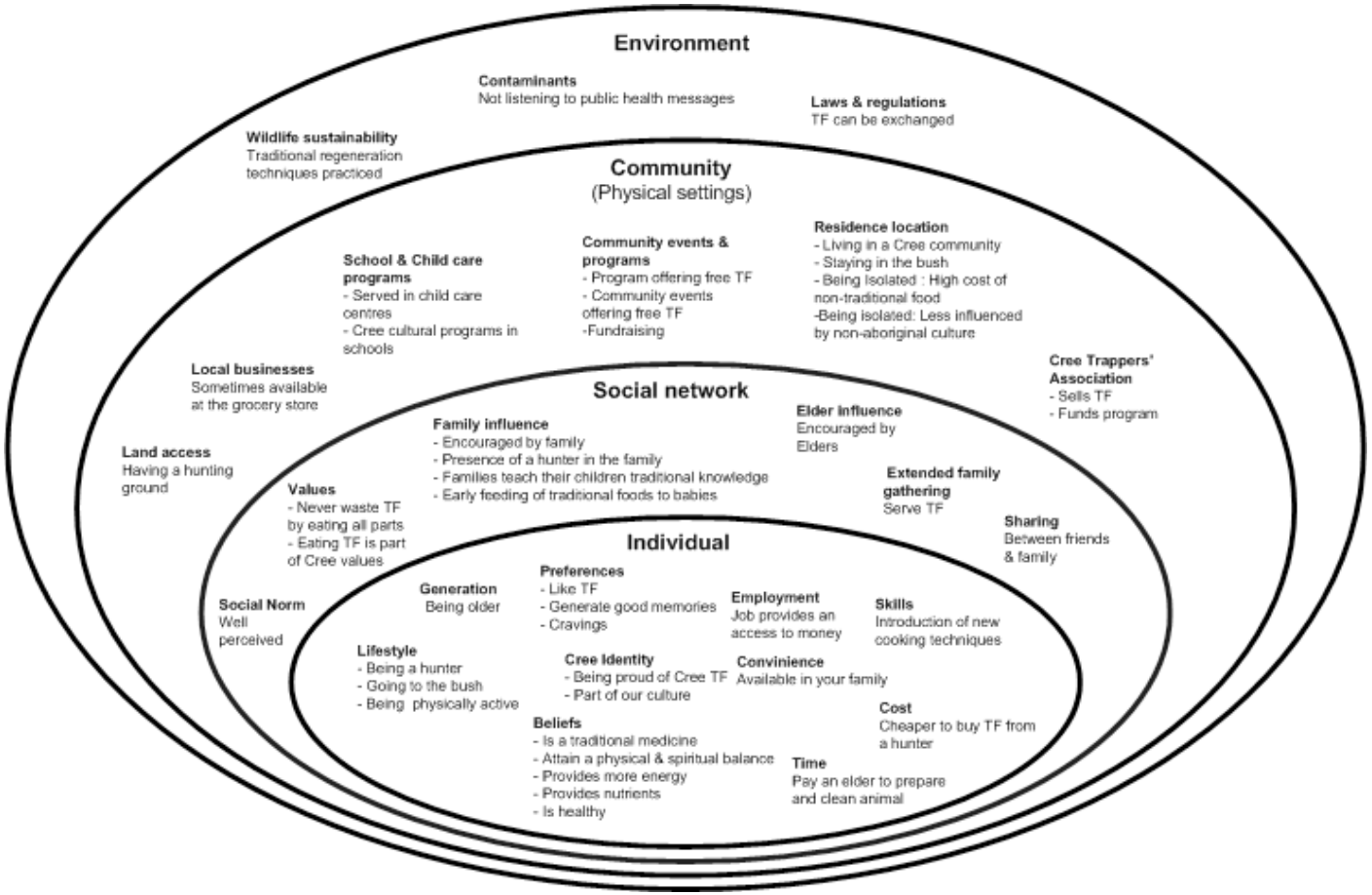
5.4 Results

The ecological model provides a framework within which it is possible to explore potential obstacles and facilitators of traditional food consumption. The model consists of a series of concentric circles, here called levels of influence, which illustrate different factors influencing an individual's food choices. The inner circle, the individual level, includes individual characteristics and behaviours. The next concentric circle, the social network level, includes family members and other people who interact directly with the individual. The third circle, the community level, includes physical settings in a community, such as schools and workplaces. The fourth circle, the environmental level includes larger societal influences such as the greater economic, ecological and political contexts.

The use of the ecological model suggests that traditional food choices occur as a result of interactions between factors and different levels of influence. Food choice is an ongoing process through which individuals interact actively and iteratively with proximal and distal environments (Bronfenbrenner 1979). The individual has the ability to participate in and restructure his/her environment just as his/her environment influences that particular individual (Bronfenbrenner 1986). In addition, this model suggests that food choices are the result of multiple interconnected influences among different levels, rather than being the influence of a single factor.

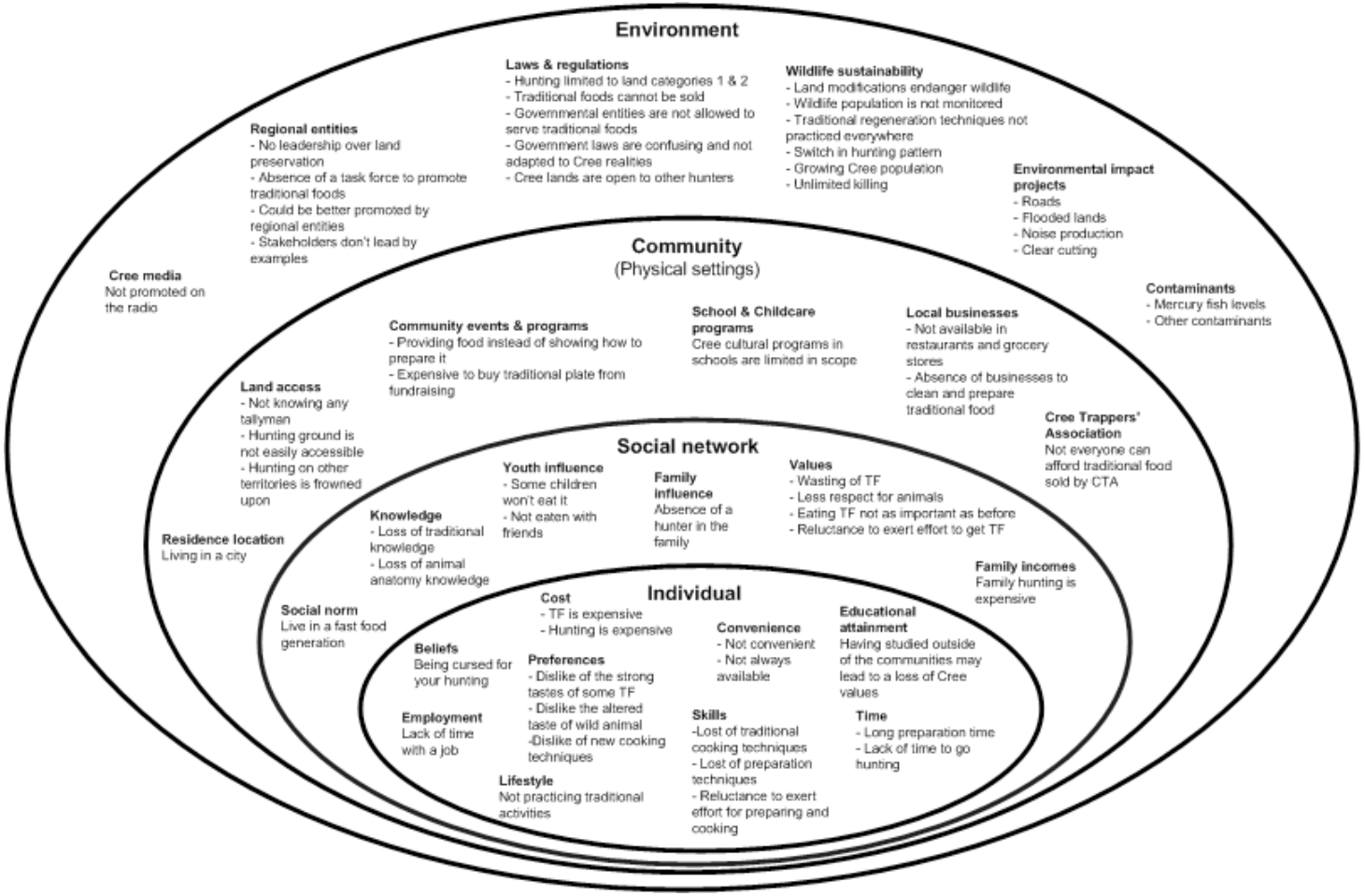
Figure 1 and Figure 2 provides ecological models of facilitator (Figure 1) and obstacles (Figure 2) illustrating the role of numerous influences on traditional food consumption.

Figure 1 Ecological model of facilitators*



* In this figure, TF stands for traditional food

Figure 2 Ecological model of obstacles[†]



[†] In this figure TF stands for traditional food

Tables 2 ,3 ,4 and 5 describe in more detail the results of the focus group analyses: they describe the factors identified by participants as influencing their food choices. Each table represents a level of the ecological model, and four levels are described: individual, social network, community and environment. Each table provides the name and a short description of the factors influencing traditional food consumption. Two additional columns, facilitators and obstacles, explain how each of these factors influences (positively or negatively) traditional food consumption. Finally, the last column provides quotes illustrating a facilitator or an obstacle.

Individual level (Table 2)

This level includes factors influencing the intake of traditional foods such as a person's preferences, employment status, education and lifestyle. With regards to food preferences, some participants mentioned that they used to like the taste of wild game but that alterations in the wild animals' eating habits have changed the taste of the meat. For example, as a result of the environmental impact of development projects and a greater human presence on Cree territory, bears are feeding themselves on garbage, which changes the taste of their meat. In addition, some people use non-traditional recipes and cooking techniques to prepare wild game (ex: spaghetti sauce with ground moose meat), which facilitates the cooking of traditional foods for some but is not appreciated by everyone. Studying outside the community was also seen as a possible threat to the survival of traditional Cree culture because an educated person could be seen as no longer caring about traditional foods.

Secondly, individual factors are related to Cree beliefs and identity. These are generally facilitators of traditional food consumption: people are proud to consume traditional foods and

believe it is high-quality food. However, the traditional belief that shamans have the power to curse people and impede their ability to hunt was mentioned as an obstacle.

Finally, other individual factors included cost, time, skills and convenience. In this study, these were most often perceived as obstacles to the consumption of traditional foods. For example, traditional food was seen as being expensive and inconvenient, and its preparation as requiring special skills and a lot of time.

Table 2 Facilitators and obstacles classified by factors for the Individual level *

Factors	Description	Facilitators	Obstacles	*Quotes*
Generation	Age	**Being older**		*"The elders are more used to eating traditional food."*
Lifestyle	Practice of traditional activities or hunting; Practice of physical activity	- **Being a hunter** - Going to the bush - Being physically active	Not practicing traditional activities (i.e.: snowshoeing, carving, hide tanning and sewing)	*"I guess people that are more tradition- oriented eat more food and walk more. Because if you want to eat: you drive to the store and then, you drive home. Whereas a hunter would go and hunt. Walk. Check the snares. You have to race - run after a moose."*
Preferences	Preferences, aversions, emotions, cravings, moods and feelings	- **Like traditional food** - **Generates good memories** - Cravings	- Dislike of the strong tastes of some traditional foods - Dislike the altered taste of wild game - Dislike new cooking techniques	*"You know what I mean everybody eats traditional food but they have their own preference what traditional food is."* *"it brings back memories of things in my childhood or the bush"*
Employment	The state of being employed	**Job provides an access to money**	**Lack of time with a job**	*"We were talking about money and for those who are non-employed, where do they get their money to get their bush food? And those who are employed may have the money but they don't have the time"*
Educational attainment	School attendance outside of the community	_____	**Having studied outside the communities may lead to a loss of Cree value**	*"They have more education so they don't care about traditional Cree food."*
Cree Identity	A way to differentiate Crees from other cultures	- Being proud of traditional Cree food - **Part of our culture**	_____	*"I wouldn't say it's (traditional food) a whole identity but a major part"* *"And I think also, like, it influenced me more to be more Indian, like, eat more traditional food and, like, to sew and learn, like, the Cree ways."*
Beliefs	Attitudes, faith, perceptions of health, relationships between lifestyle and health	- Provides more energy - Provides nutrients - **Is healthy** - Is a traditional medicine - **Helps attain physical & spiritual balance**	Being cursed for your hunting	*"It's a lot healthier: traditional food is healthy food"* *"I am in Montreal and I don't eat it(traditional food) I don't feel myself, I don't feel my own and am out of balance and if I eat it I feel better you know, I don't know if that is like a spiritual thing"*
Skills	Competency or dexterity acquired or developed through training or experience	Introduction of new cooking techniques	- **Loss of traditional cooking techniques** - **Loss of preparation techniques** - Reluctance to exert effort for preparing and cooking	*"All of those preparations and cooking methods are going out the window."* *"... is really hard for us to try to cook a feast the right way."...* *"I think it is the reason why some of the young people don't eat that much traditional food because they don't know how to prepare it."*
Time	Period necessary or available for a given activity	Pay an elder to prepare and clean animal	- Long preparation time - **Lack of time to go hunting**	*"They are too lazy or they don't have the time I should say to prepare the food"*
Convenience	Present and ready for use: at hand	Available in your family	- **Not convenient** - Not always available	*"I think people ... hum ... are lazy cooking traditional food not like when you get something from the store you just open it and put it in the microwave very easy and convenient but to cook traditional food you have to cut it up boil it or you put it in the oven"*
Cost	Amount paid or required: price	Cheaper to buy traditional foods from a hunter	- **Traditional food is expensive** - **Hunting is expensive**	*"Our 3 partridges and a rabbit probably cost us 60 $. Not counting the shells, just the gas. So in that way, it is expensive."*

***** Bold facilitators and obstacles are illustrated by a quote

Social network level (Table 3)

The social network level includes all factors related to the relationships with others. For this level, the most important influences on traditional food consumption relate to one's family. People reported that they always have access to traditional food at their parents' or grandparents' homes:

"*Usually my mom makes traditional food when I'm at her house - at family gatherings and also for birthdays."*

The presence or absence of hunters in one's family is identified, respectively, as a facilitator and an obstacle. Because hunting is typically a family activity, family income was mentioned as having an influence on traditional food consumption. Younger generations are perceived as losing their Cree values and of showing less interest in consuming traditional foods:

"Family doesn't insist that the children eat (traditional food), it is changing values."

"The Cree values of respecting animals is not being passed on, you know. From the elder's to the youth, I think it has a lot to do, well it is respecting the animals, plus the environment, you know."

Finally, sharing was identified as a facilitator, although participants noted that it is becoming more difficult due to the high cost of hunting and limited access to traditional foods.

Table 3 Facilitators and Obstacles classified by factors for the Social Network level*

Factors	Description	Facilitators	Obstacles	*Quotes*
Family influence	Family members affecting the consumption of traditional foods	-Encouraged by family -Presence of a hunter in the family **-Families teach their children traditional knowledge** -Early feeding of traditional foods to babies	**Absence of a hunter in the family**	*"Well it all depends if the parents are hunters of if they have access to it (TF). With the hunters they can bring the food and if you can`t marry a hunter you will have a hard time finding traditional food."* *"But my parents still teach my kids. Like I said, with certain animals in the spring time. It's traditional."*
Elder influence	Elders affecting the consumption of traditional foods	**Encouraged by elders**	_____	*"I told myself to be more into it, like, what the elders were trying to teach me. I think it had a lot of influence on me"*
Youth influence	Youths affecting the consumption of traditional foods	_____	**-Not eaten with friends** -Some children won't eat it	*"My friends, they don't even talk about traditional food or, like, let's have some beaver; whereas my family would call me and say they come on over we cooked some partridge"*
Social norm	Rules socially enforced. Influenced by culture	**Well perceived**	**Live in a fast food generation**	*"it's well seen by the community to eat traditional food "* *"We live in a fast food generation and traditional food is in the slow food generation."*
Sharing	To make joint use of traditional food	**Shared between friends & family**	_____	*"Generally at goose break or moose break they have lots of meat and lots of geese, or ducks or anything. We pass it all around within our family and friends."*
Extended family gatherings	Walking-out**, weddings, family events,	**Family gatherings serve traditional food**	_____	*"Feasts, Well when there is a walking- out ceremony there is always a feast with it (traditional food) to or weddings, Special occasions"*
Family incomes	Wages, Family salaries	_____	**Family hunting is expensive**	*"The family have to have money to be able to access it (traditional food)"* *"What I heard if there is a family of 5 or more, you have to have at least 5 thousand dollars or more to spend on all the equipment that you need for hunting, fishing and trapping. And it's expensive because of the way we live today, the things we are eating, the things that we travel with and we need a lot of gas money"*
Values	Basic notions people have about how the world functions.	**-Eating traditional food is part of Cree values** -Never waste traditional food by eating all parts of the animal	-Wasting of traditional food -Less respect for animals -Eating traditional food not as important as before **-Reluctance to exert effort to get traditional food**	*"I wouldn't probably be following my Cree values I guess like I would have stopped eating traditional food."* *"So those day, you will see a caribou, aaah it is going to be too much work to pull out, go back to the road and look for some more (yeah) (laughing). Before it was, Oooh. Caribou tracks okay let's go, we are chasing those for the next days until we catch up with them and get one. But now days, it is aaaah he is not on the side of the road so I won't shoot them will go look for another one (laughing)"*
Knowledge	Awareness, or understanding gained by experience or education	_____	**-Lost of traditional knowledge** -Lost of animal anatomy knowledge	*"I think the biggest at the community level is to figure how to pass the knowledge. Yeah. Yeah. Both of hunting and cooking and for preserving but because… on the individual level with the family it is not really (pass on)."*

*Bold facilitators and obstacles are illustrated by a quote

**Walking-out: is a traditional Cree ceremony where a family introduces its child to the community, and introduces the child to his/her traditional role as a male or female within Cree society.

Community level - physical settings (Table 4)

The community level corresponds to the physical settings that influence the consumption of traditional foods. The absence of traditional foods in restaurants and grocery stores was mentioned as an important obstacle to traditional food consumption. Most people interviewed wanted to see greater involvement on the part of local schools and childcare facilities to increase traditional food availability and improve the content of cultural classes where traditional cooking techniques and practices are taught. However, the Band Council and the Cree Trappers' Association were generally seen as facilitators of traditional food consumption even if some improvements were suggested. As part of a program designed to promote traditional knowledge and practices, the Mistissini Band Council offers a program where traditional food is served an average of 6 meals per week. Although meals are free for everyone, it is only accessible by car and no transportation is provided. In addition, the cultural norm dictates that elders eat first and because many elders attend, there is not always enough food for the younger members of the community.

Unique to traditional food consumption, when compared with food choices among the general population, is access to a hunting ground. According to the participants this is a crucial factor influencing traditional Cree food consumption. Having little access to hunting grounds or not knowing a tallyman (an individual recognized by the government to manage and take care of his family's trap line and who controls access to these traditional hunting-trapping grounds) impedes the consumption of traditional food. Participants mentioned an increase in traditional food intake when staying at a hunting camp:

"That's like when we are in the bush we intend to practice our traditional ways more than when we live in the community because traditional food is more accessible."

Where a person lives -- "residence location" -- is both a great facilitator and big obstacle. Staying in the bush is a major contributor for accessing traditional foods, followed by living in a Cree community. Then staying in the city, was identified as a major obstacle. Finally, community remoteness is considered as a facilitating factor due to the low influence of other cultures.

Table 4 Facilitators and obstacles classified by factors for the Community level*

	Factors	Description	Facilitators	Obstacles	*Quotes*
Physical Setting	**Residence location**	Place where a person lives	**-Living in a Cree community** -Staying in the bush -Living in an isolated Cree community because: -Less influenced by other culture -High cost of non-traditional food	**Living in a city**	*"If that person is in the land of the Whiteman, he or she will eat Whiteman's food. The food you eat depends on where you are."* *"Like when I am here (in the community) I am able to have traditional food pretty much every weekend. Outside the community is a big problem of having access to traditional food"*
	Land access	Ability to access a hunting ground	Having a hunting ground	-Not knowing any tallyman **-Hunting ground is not easily accessible** **-Hunting on other territories is frowned upon**	*"People that don't have land they cannot really go out (hunting)"* *"But you can't just go hunting anywhere ... I don't know who's territory it is because it is like stealing you know"*
	Community events & programs	Collaborative activities planned in the community	-Band Council programs offering free traditional food **-Community events offering free traditional food** **-Fundraising**	-Providing food instead of showing how to prepare it -Expensive to buy traditional plate from fundraising	*"A lot of these community groups I guess whenever there is a community feast we always include traditional food"* *"The other thing I've noticed is that people sell plates - traditional plates. That's how my mom gets some and that's how I get some too."*
	School & Child care programs	Activities planned in schools or child care centres	-Served in child care centres -Cree cultural programs in schools	**Cree cultural programs in schools are limited in scope**	*"It's supposed to be there at the school in the Cree culture but they don't do much they will make paddle that this big (showing a paddle the size of an hand) and not good for anything (hum-hum) And the axe handle are like this instead of the real axe handle. So that knowledge from knowing how to do it form long time ago, to be passed on now is very fastly disappearing. I don't think my son can make a paddle either but. My father in law used to be very good at it."*
	Cree Trappers' Association (CTA)	Organization designed to protect and maintain a Cree way of life	**-Sells traditional food** -Funds program	Not everyone can afford traditional food sold by CTA	*"I would say that like community groups like the CTA and bands they do promote traditional food and they do have the CTA a program that they buy and sell traditional food. They have a freezer and in the freezers that's where they store the goods I guess… There are beaver …."*
	Local businesses	Organization designed to provide goods or services in the community (Grocery stores, Restaurants)	**Sometimes available at the grocery store**	**-Not available in restaurants and grocery stores** -Absence of businesses to clean and prepare traditional food	*"I wish that the stores here sold traditional food. (laughter) We should be getting it from the store. What I said was, they should sell traditional food at the store."* *"And the other thing is, the restaurants don't serve traditional food. None of the restaurants serve it."*

* Bold facilitators and obstacles are illustrated by a quote

Environment level (Table 5)

For this level, we identified two main sub-groups: ecology and government. Ecological factors, such as wildlife sustainability, environmental impact projects and contaminants greatly influenced traditional food consumption. To maintain wildlife populations, participants mentioned the importance of monitoring wildlife and respecting traditional Cree regeneration techniques. As for environmental impact projects, such as hydro-electrical projects, mining, and forestry, they were seen as major obstacles to the consumption of traditional foods. The preservation of wildlife populations and the impact of large-scale projects are clearly issues of great importance to the Mistissini community, as this discussion elicited many comments and emotional reactions from the focus group participants.

For the government sub-group, laws and regulations were seen as obstacles to traditional food consumption. For example, the Quebec government does not allow traditional foods to be served in public institutions. Forbidding Cree and public entities to sell traditional foods was mentioned several times as being a barrier.

Cree regional entities and media, aside from the Cree Trappers' Association were seen as not prioritizing the promotion of traditional food or traditional activities.

Table 5 Facilitators and Obstacles classified by factors for the Environment level*

	Factors	Description	Facilitators	Obstacles	*Quotes*
Government	**Laws & regulations**	Rules of conduct or principles established by agreement or authority	Traditional foods can be exchanged	-Hunting limited to land categories 1 & 2 -**Traditional foods cannot be sold** -Governmental entities are not allowed to serve traditional foods -Government laws are confusing and not adapted to Cree realities -Cree lands are open to other hunters	*"Well if we look at each entity I guess grocery stores and restaurants are not allowed to promote traditional food and it's against the law in some way. Is it like, you cannot serve any traditional food? Like at the store"*
	Regional entities	Grand Council of the Crees, Cree Regional Authorities, Cree Health Board, Cree School Board	———	-No leadership over land preservation -**Absence of a task force to promote traditional foods** -Could be better promoted by regional entities -**Stakeholders don't lead by example**	*"I think it would be essential to have a some kind of working group on traditional food, because we sort of need a lot of educational part to the community and the family."* *"for the grand chief, he probably eats traditional food but I don't really see him, It's like he is a promoter I guess. Like if they give the example more people would eat it. I think they should promote it."*
	Cree media	Television (Maamuitaau), Newsletter (Nation), Radio	———	**Not promoted on the radio**	*"The regional radio station … Maamuitaau It is on now They use to promote it eh for like cooking but when you listen to the radio you barely hear about anything traditional, all they talk about is hockey and they talk Cree you know. I think it's kind of a block to me"*
Ecology	**Wildlife sustainability**	Potential longevity of non-domesticated plants and animal systems	**Traditional regeneration techniques practiced**	-Land modifications endanger wildlife -Wildlife population is not monitored -Traditional regeneration techniques not practiced everywhere -Switch in hunting patterns -Growing Cree population -Unlimited killing	*"They used to say that one family would live with another family in their traditional camp grounds - hunting grounds so that the animals would prosper. In terms of game reproduction - the animals."*
	Environmental impact projects	Hydro-electrical projects, Forestry, Mining and other industries modifying the environment	———	-Roads -**Flooded lands** -Production of noises - **Clear cutting**	*"Well here the flooding lands and clear cutting has a huge affect on the animals The animals… Even the fish… They have changed their course. Yah, even the birds… Like during goose break they change their course when they go up North."*
	Contaminants	Results of pollution	Not listening to public health messages	-**Mercury fish levels** -Other contaminants	*"The other thing about the environment is the mercury levels in the fish. The medical field says you can't consume as much as you can so people lose interest in eating fish"*

* Bold facilitators and obstacles are illustrated by a quote

5.5 Discussion

The scientific community emphasizes a need for describing the traditional food process from an Aboriginal perspective (Skinner, Hanning, and Tsuji 2006). The numbers of obstacles and facilitators identified in this study concord with existing factors such as contaminants, environmental impact projects, laws and regulations, physical settings and social networks (Nudelle et al. 2007).

It is obvious that ecological and wildlife sustainability were seen as significant factors. Without a healthy balanced flora and fauna, the consumption of traditional foods would be extremely difficult (Chan et al. 2006; Kuhnlein and Receveur 1996; Guyot et al. 2006). At the social level, it was generally the family who was promoting traditional food consumption and friends who were blocking it. Many studies have revealed the considerable influence of social networks on health, beginning with the family and extending to other groups (Breslow 1996; Delormier, Frohlich, and Potvin 2009; Nestle et al. 1998; Patel and Schlundt 2001; Shepherd 1999). Previous studies have documented a decrease in sharing practices (Power 2008; Delormier, Kuhnlein, and Penn 1992). However, the Crees of Mistissini are still practicing sharing on a regular basis and it would be interesting to investigate to what extent. Finally, income is usually measured at the individual level, but according to our study, when it is associated with traditional food consumption, family income might be a better predictor.

Factors identified under the individual level, such as individual characteristics, cost, convenience, and time, are common not only for traditional foods, but for any food choice model for the general population (Glanz et al. 1998; Raine 2005; Booth et al. 2001; Traill, Chambers, and Butler 2011). Indeed, food preference is recognized as being an important factor in general food choices and traditional food remains a favourite food for many

Aboriginal peoples (Nakano, Fediuk, Kassi, Egeland et al. 2005; Drewnowski 1997; Rozin and Vollmecke 1986). In the current study, preference acted both as a facilitator and an obstacle. Participants mentioned they liked traditional food, craved it, and had memories attached to it; however, they also mentioned that they did not like the taste of some wild animals or some parts of these animals, and they did not like some of the cooking techniques used to prepare these meats. In our focus groups, we noted that differences in preferences varied by age group. For instance, older people tended to prefer a greater variety of traditional foods. However, older and younger people also defined traditional foods differently. For example, some elders did not consider wild game prepared according to a non-Cree recipe as part of the Cree traditional diet; whereas other participants considered all wild game as 'traditional food'. Nevertheless, all participants agreed that the consumption of traditional foods was an important part of the Cree identity, and that eating traditional foods helped them connect with their culture. Interestingly, some participants mentioned having access to traditional meat, but not having the time or the knowledge of how to prepare it, clean it, or cook it.

As for the cost of traditional foods, many mentioned the high cost of hunting. In fact, nobody mentioned it as being cheaper than market foods -- which contradicts a previous study (Wein 1994) -- perhaps due to the increased cost of hunting equipment (guns, snowmobiles, gas) over the past few years (Chan et al. 2006; Lambden et al. 2006). Cost shows how one factor can cut across different levels of influence in an ecological model, and how it interacts with other factors at each of these different levels. For example, at the individual level, cost may interact with convenience to motivate a consumer to buy market foods instead of traditional foods; especially if he/she has to provide supper for a big family (cost is now interacting with family

which is under the social network level). In addition, if, at his/her local grocery store (community level), traditional food is very expensive because of governmental laws and regulations (environmental level) requiring rigid and expensive handling and hygiene measures, it makes it very difficult to choose traditional foods.

During focus group interviews, participants suggested some solutions to promote traditional foods, like: creating a task force; selling traditional foods harvested locally at local grocery store(s) and restaurant(s); "*Figuring out how to pass on (traditional) knowledge*"; or implementing services where people can have their animal cleaned and prepared:

"Maybe if they have a place where we can bring ducks and geese and they prepare it and cut it up and, like, smoke it and then they give it back to you so you can preserve it, and eat it with your family. ***You mean like…*** *Like an organization or a group of persons in the community preparing all the traditional food, for those who don't know how to prepare it they can take it over there and prepare it for you and give it back to you so you can feed your family. Even if you catch a lot of fish there, like for me I don't know how to smoke it, I can bring it to them and they prepare it for me and they give it back and I can eat with my family."*

Our focus group participants did not all support this last proposal. For some, it is not enough to consume traditional food for its nutritional value. They argue that the social, cultural and spiritual aspects of obtaining and preparing traditional foods are just as important. Consequently, this knowledge and these traditions should be passed on to future generations. Some Crees can be torn between their community obligation to work at a sedentary job and their traditional hunting practice, which requires many days in the bush. However, maintaining the consumption of traditional foods but skipping time-consuming activities such as cleaning and preparing might possibly lead this knowledge to be lost over time.

Interestingly, all solutions were at a community or environmental level, whereas none were at the individual level. It seems that participants felt that the maintenance of traditional foods is a

community responsibility and that individuals do not have much power over it. This highlights the importance of implementing environmental strategies to promote traditional foods. In contrast, the majority of traditional food determinants identified in the scientific literature are mainly at the individual level.

The choice of the ecological model as a conceptual framework was appropriate because it allowed all of the factors to be categorized, highlighting the importance of community and environmental influence. Because the ecological model is broad and includes the environment and the community, it is directly in line with the Cree vision. With the ecological model, we were able to map different levels of influence for traditional food consumption, taking into consideration the influence of each obstacle and facilitator.

In our study, we had a wide range of participants. Some were visionary thinkers holding strategic political positions in the community, others were unemployed community residents; some were hunters, whereas others were not. The moderator and researcher were familiar with Cree culture, which facilitated the initial contact and the establishment of trust (Fontes 1998). Both were attentive listeners, and were at ease in terms of Cree interpersonal relations, which facilitated the recruitment of participants and the flow of discussions during the focus groups. For example, traditional food is a subject that Cree people like to discuss at length; in addition, the moderator and researcher were aware that in the Cree tradition, it is important not to interrupt a person while they are talking. As a result, when participants seemed to be veering off-topic, they were not interrupted, and went on to share interesting and unexpected opinions.

Limitations

One of the weaknesses of focus groups is that the participants tend to portray themselves as rational individuals, when we know that food choice is not always a rational one (Krueger and Casey 2009). Another limitation of focus groups is that participants tend to project a socially acceptable image of themselves, and a person may express an opinion in line with the rest of the group even if it is at odds with his/her personal opinions (Smithson 2000). Finally, one or several group members might dominate the discussion, which may result in the expression of only one opinion (Smithson 2000). To avoid this limitation, a skilled moderator was used to stimulate the more quiet participants. When necessary, a Cree interpreter was used to facilitate discussion; however, the translation from Cree to English probably lead to a loss of information (Miles and Huberman 2003; Smithson 2000).

5.6 Conclusion

Traditional foods should be part of public health strategies to reduce the burden of chronic diseases and to improve wellbeing. Even a little traditional food consumption improves diet quality and provides various social and cultural benefits (Kuhnlein and Receveur 1996). Traditional food is part of the Aboriginal identity and several indications demonstrate that Cree Youths would like to pursue traditional activities, at least on a seasonal or part-time basis (Wein, Sabry, and Evers 1991). Employing an ecological approach allowed us to look at the various levels of influence and their interactions, which helped in the design of a comprehensive public health approach that would make choosing traditional foods the easiest choice. It also highlighted the importance of combining individual and environmental promotional strategies, even if according to our result more emphasis should be laid down on

community and environmental strategies. Increasing traditional food intake requires a sustained public health effort to address not only individual behaviours but mainly the communities and environments within which the Cree live and make choices. The present study has identified a number of factors involved in traditional food consumption. Obstacles and facilitators to traditional foods have not previously been examined in the Cree community and these finding have an immediate application in public health planning. These results also suggest the need to plan multi-level intervention studies to address declining traditional food consumption.

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6. Discussion

L'objectif de ce mémoire est d'identifier les facteurs qui facilitent ou limitent les choix d'aliments traditionnels chez les Cris au nord du Québec. Nous avons, à cet effet, eu recours, pour le premier article scientifique, à une méthodologie mixte combinant une régression logistique à des groupes focus, nous permettant de mieux interpréter les résultats des analyses quantitatives. Cette stratégie a été utilisée pour expliquer les résultats significatifs et non significatifs ainsi qu'élargir l'interprétation des résultats avec la vision des participants. Ainsi, cinq associations statistiquement significatives ont été identifiées : être âgé entre 40 et 90 ans, être chasseur, marcher 30 min et plus par jour, n'avoir complété aucune scolarité ou avoir seulement complété des années de scolarité à l'école primaire et vivre à Mistissini sont associés à une consommation de la nourriture traditionnelle 3 fois par semaine. En général, les participants étaient d'accord avec ces associations statistiques (Table III, p. 44 et Tableau III, p.IV-5). Néanmoins, malgré qu'aucune association statistiquement significative n'ait été identifiée pour ces variables indépendantes, les participants croyaient qu'il existe des associations entre la fréquence de consommation d'aliments traditionnels et l'IMC, le statut d'emploi, la perception de santé, les craintes face aux contaminants et la langue anglaise utilisée à la maison. Par exemple, aucune association statistiquement significative entre l'IMC et la fréquence de consommation d'aliments n'a été identifiée dans la littérature scientifique. Par contre, les participants croyaient que les Cris souffrant d'obésité consomment plus d'aliments traditionnels, puisqu'ils consomment de plus grosses portions. Même chose pour la présence de contaminants qui n'était pas statistiquement significatif dans la régression logistique mais qui a été nommée comme obstacle à la consommation d'aliments traditionnels

par les participants des groupes focus. On peut ainsi conclure que certains résultats obtenus durant la phase qualitative divergent des résultats de la phase quantitative.

« *Dans une telle situation, les chercheurs ne disposent souvent pas de règles précises et impartiales pour trancher en faveur de l'une ou l'autre des interprétations. La seule façon de tirer des conclusions est de privilégier l'une des approches, au risque du même coup de discréditer l'autre. C'est alors qu'apparaît l'arbitraire de la décision, prise tantôt en fonction des préférences méthodologiques des chercheurs, tantôt en raison de considérations politiques ou autre qui n'ont souvent rien à voir avec la rigueur méthodologique de la démarche »* (149, pp. 116-117).

Pour les raisons suivantes, il est très difficile de trancher pour l'un ou l'autre des résultats quantitatif ou qualitatif. Un résultat non significatif en recherche quantitative ne signifie pas toujours une absence réelle d'association. Il est possible que de complexes interactions empêchent de mesurer le phénomène ou encore que les variables indépendantes étaient mesurées avec trop d'erreurs. C'est pourquoi des recherches plus approfondies seront nécessaires dans le futur.

En ce qui concerne le statut d'emploi, plusieurs études se contredisent sur l'influence qu'il exerce sur la consommation d'aliments traditionnels (105, 115-117). Dans notre cas, durant la phase quantitative, nous n'avons trouvé aucune association significative. Cependant, les participants n'étaient pas d'accord avec ce résultat et croyaient que travailler donne accès à de l'argent pour payer les dépenses reliées à la chasse. Par contre, le travail réduit les disponibilités d'aller chasser ; inversement, les Cris sans emploi ont plus d'opportunités pour aller chasser mais peu d'argent pour couvrir les dépenses. Ce double effet aurait possiblement fait disparaître l'association dans le modèle de régression logistique. On reproche souvent aux études quantitatives de ne pas tenir compte de la complexité de la réalité étudiée, de ces multiples interactions (149, 150). En utilisant une méthodologie mixte, il a été possible

d'émettre des hypothèses plausibles à l'interprétation des résultats quantitatifs. Il en va de même pour Mistissini. En fait, il est très surprenant de constater que la communauté la moins isolée et la plus grosse soit celle qui consomme le plus d'aliments traditionnels. Ce résultat ne concorde pas avec la littérature (44, 104, 106) et l'ajout d'une phase qualitative a amené beaucoup de richesse à l'interprétation de ce résultat.

Le deuxième article scientifique nous a permis d'explorer en profondeur les facteurs et d'identifier les facilitateurs et obstacles impliqués dans la consommation d'aliments traditionnels pour chaque niveau d'influence : individuel, social, communautaire et environnemental. La plupart des facilitateurs et obstacles identifiés s'expliquent de façon logique et/ou concordent avec la littérature scientifique (30, 84, 108). Néanmoins, il est surprenant de constater que l'effet du stress sur la consommation d'aliments traditionnels n'a pas été mentionné à l'opposé d'autres études faites avec la population générale où l'on retrouve le stress comme déterminant de l'alimentation (80, 151). Il apparaît pourtant que la grande majorité des Cris ont vécu des évènements stressants qui ont changé à jamais leurs habitudes alimentaires; par exemple, plusieurs Cris refusent de manger des épinards car ils y ont été forcés à l'école résidentielle (observation personnelle). Cette absence de mention du stress comme déterminant du choix d'aliments traditionnels reste inexpliquée et pourrait être explorée dans de futures études.

Il existe une multitude d'études s'intéressant aux déterminants de l'alimentation. Par contre, seulement quelques études se sont intéressées aux facteurs qui influencent les choix alimentaires des peuples autochtones. Il est déconcertant de constater une telle abondance de données pour la population générale et si peu pour les populations autochtones. Tel que mentionné auparavant, nos résultats concordent avec la plupart des facteurs retrouvés dans la

littérature scientifique s'adressant aux autochtones et utilisant une méthodologie quantitative ou qualitative (27, 30, 104). Néanmoins, aucune des études consultées n'a utilisé un devis mixte pouvant ajouter une nouvelle dimension à l'interprétation des résultats. En plus, à ma connaissance, aucune étude n'a utilisé le modèle écologique. En 2006, Pagé, dans son mémoire, a eu recours à un modèle écologique pour répertorier tous les facteurs impliqués dans le choix alimentaire pour les enfants de la communauté de Moose Factory (118). Cependant, elle ne s'intéressait pas spécifiquement à l'alimentation traditionnelle. Ainsi, la comparaison des deux articles fait ressortir l'importance des déterminants environnementaux, communautaires et sociaux dans le processus du choix d'aliments traditionnels qui sont souvent mis de côté dans les devis quantitatifs. En 2003, Pelto recommandait que les futures recherches en nutrition

« *Visent les mécanismes qui lient les déterminants sociaux à la nutrition; Développent des modèles intégrés avec les déterminants sociaux de la nutrition; Augmentent l'utilisation de méthodes d'approche mixtes et développent des modèles intégrant les interactions biologiques et sociales* » (127, p.1232).

La combinaison des résultats des deux articles scientifiques permet de décrire un phénomène complexe en offrant un portrait global du choix alimentaire incluant les déterminants sociaux, communautaires et environnementaux. Dans ce contexte, la recherche quantitative a permis de répondre à une hypothèse bien définie tandis que la recherche qualitative a offert un aperçu des facteurs impliqués dans le choix alimentaire. Il est ainsi possible de généraliser certains facteurs identifiés dans la régression logistique, tout en permettant aux participants de s'exprimer et de documenter en profondeur le phénomène dans son contexte (148).

On peut ainsi conclure que l'ensemble du mémoire répond adéquatement à l'objectif de notre recherche, soit d'identifier les facteurs qui facilitent et qui limitent la consommation d'aliments traditionnels chez les cris de la Baie James.

6.1 Critères de rigueur en recherche qualitative

Selon Maxwell, le but d'une recherche qualitative n'est pas de généraliser mais plutôt de décrire, d'interpréter ou d'expliquer (152). Ainsi, la qualité d'une recherche qualitative n'est pas déterminée par l'application rigide des critères de rigueur exposés ci-dessous. Néanmoins, pour cette recherche, j'ai considéré que ces critères pouvaient être utilisés comme guide pour l'appréciation du mémoire.

La crédibilité est la relation d'égalité entre le construit réel des participants à travers leur histoire et la reconstruction qui leur sont attribués durant le processus d'analyse. Plus simplement : « est-ce que les résultats de la recherche reflètent l'expérience des participants de façon crédible » (153, 154) ? L'atteinte de crédibilité a été facilitée par mon expérience de travail dans les communautés depuis 10 ans, permettant de faire des interprétations culturellement sensibles. En plus, les analyses étaient régulièrement validées durant des rencontres de travail ou auprès de membres de la communauté de façon formelle ou informelle. Mays et Pope (2000) appellent ce critère « *Respondent validation* » ou validation par les répondants et suggèrent de le considérer comme une étape nécessaire afin de réduire les erreurs et d'enrichir les interprétations au lieu de le considérer comme un critère de validité (155). Selon ces mêmes auteurs, le but des chercheurs est différent de celui des personnes impliquées et ces différences de visions ne doivent pas altérer le processus d'analyse (155). Il est donc possible qu'un désir de plaire aux répondants couplé à ma grande implication dans la

communauté ait pu inhiber mon jugement critique (156). Ma formation de nutritionniste a possiblement joué un rôle, m'amenant ainsi à porter plus d'attention sur des catégories que je jugeais essentielles. J'aurais même pu, involontairement, influencer le choix de certains participants pour étoffer certaines catégories en utilisant « l'échantillonnage discriminatoire». Tel que mentionné par Finlay, dans la recherche qualitative, le chercheur est une figure centrale qui influence la collecte, la sélection et l'interprétation des données (157). Néanmoins, connaissant les risques liés à ma grande immersion, j'ai tenté, pour chacune des étapes du mémoire, de me rappeler ce possible biais, d'être le plus neutre possible et de rapporter ce que les participants ont partagé sans le modifier. Ce concept que j'appelle « auto-critique » ou « analyse réflexive » réfère au concept de réflexivité qui est l'influence des expériences et des préconçus du chercheur qui modulent l'interprétation des données (155). En plus, au cours de la sélection des participants, un effort a été fait pour recruter des participants ayant un point de vue différent et des expériences différentes pour ainsi diminuer l'influence de mon biais personnel. En effet, les participants possédaient des caractéristiques personnelles diversifiées tel que l'âge, le sexe, la pratique de la chasse et le statut d'emploi. Ces différentes caractéristiques permirent de contraster différentes opinions et d'offrir un portrait global des facteurs impliqués dans le choix alimentaire (158). Finalement, il est aussi possible que mon appartenance à une culture différente de celle des participants interviewés ait pu minimiser le « biais » associé à un trop grand degré d'immersion.

En ce qui concerne la triangulation, elle compare les résultats de deux ou trois différentes méthodes de collecte de données ou sources de données (155). Leur convergence valide les interprétations. Certains chercheurs argumentent que la triangulation représente une fausse sécurité, puisque les faiblesses d'une méthode ne sont pas toujours compensées par la force de

l'autre (155, 159). Cependant, l'utilisation de plusieurs sources représente une force de cette recherche puisqu'elle permet d'enrichir davantage le modèle écologique et les facteurs affectant la consommation d'aliments traditionnels. Malheureusement, la partie quantitative n'explore pas du tout le niveau « environnemental » et très peu les niveaux « communauté » et « réseau social ». Ceci pouvant être expliqué par la difficulté d'identifier des indicateurs de mesures pour ces derniers niveaux.

La confirmabilité et dépendabilité[‡] correspondent aux concepts d'objectivité et de fidélité des recherches quantitatives (159). Ainsi, la confirmabilité s'assure que l'interprétation des chercheurs est vraiment issue des données et non pas créée par leur imagination (159). Quant à la dépendabilité, elle s'assure que les observateurs ont la même interprétation du phénomène (159). Afin de permettre une « auto-évaluation » de la part du chercheur pour ces deux critères, il est nécessaire de pouvoir retracer facilement les données, les arguments derrière le construit et les relations théoriques qui doivent être cohérentes et explicites. Afin d'être le plus transparent possible, les tableaux IV (p. IV-6) et V (p. IV-11) détaillent les citations utilisées pour chaque facteur facilitateur et obstacle dans la section annexe de ce mémoire. En plus, les analyses ont été validées lors de rencontres auprès des membres de la communauté de façon formelle ou informelle, ce qui a permis de confronter les idées et de discuter en profondeur des codifications, ce qui a sûrement enrichi grandement les analyses.

La transférabilité correspond à la validité externe et au concept de généralisabilité dans les recherches quantitatives (160). Elle dépend des circonstances spécifiques entourant le milieu. En exposant clairement les conditions dans lesquelles la théorie fut développée, d'autres

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[‡] Traduction libre de « dependability »

chercheurs pourront juger de la transférabilité de la théorie à d'autres situations. Dans le présent mémoire, on pourrait supposer une transférabilité limitée des résultats, à cause de la nature unique de la communauté autochtone, de l'aspect unique de son passé historique et de ses problèmes de santé. Malgré que le but général des recherches qualitatives soit de refléter la diversité des concepts étudiés au lieu d'aspirer à une « généralisation » des données (161), on pourrait parler d'une grande transférabilité des résultats puisque les communautés autochtones du Canada et même du monde entier vivent des difficultés communes dans des contextes similaires (103).

En conclusion, tel que mentionné précédemment, les critères de rigueur d'une recherche qualitative ne sont pas garants de la qualité. Une étude qualitative se laisse surtout apprécier à travers la qualité du design de la recherche et du traitement des résultats.

6.2 Plan de diffusion

La population crie du Nord du Québec est extrêmement sollicitée pour participer à plusieurs études, à un point tel qu'on peut sentir un certain essoufflement à l'égard de sa participation dans certaines études. Cette diminution de l'enthousiasme peut s'expliquer en partie par le manque de communication à l'intérieur des différentes organisations ainsi que sur le territoire, de l'inexpérience professionnelle et culturelle des étudiants ou chercheurs et finalement du manque d'implication des personnes locales dans les projets de recherche. D'ailleurs, en 2000, un commentaire avait été rédigé par une équipe de travail ad hoc du territoire cri, dénonçant ce problème (162). En plus, puisqu'il s'agit d'une étude interculturelle, il est primordial de spécifier les procédures «éthiques» utilisées ; c'est pourquoi on trouvera en Annexe II, p.II-1, tous les documents attestant l'obtention des approbations du comité d'éthique de la faculté de médecine de Montréal, des conseils de bande et du conseil cri de la santé. Il est aussi

important de répondre aux questions suggérées par Fontes (1998), soit «*1-Qui définit le problème de recherche ? 2- Pour qui est-ce pertinent? 3-Quel groupe culturel bénéficiera des connaissances? 4- Qui est responsable de la recherche ? 5- Qui bénéficiera le plus de la recherche?»* (163, p.55). En ce qui concerne le présent projet, puisque les membres des communautés ont été directement impliqués dans la composition de la question de recherche, il est à espérer qu'ils en bénéficieront grandement. En plus, afin d'assurer un retour des résultats, un plan de diffusion a été élaboré afin de communiquer les résultats aux équipes de santé publique et de nutritionnistes du conseil cri ainsi que pour la population crie par l'entremise du web, de la radio locale et des assemblés. On trouvera en Annexe V, p.V-1, les moyens utilisés. Finalement, des recommandations de santé publique pour la promotion de l'alimentation traditionnelle ont été élaborées en partenariat avec la santé publique du conseil cri.

7. Conclusion & Recommandations

Pour ce mémoire, l'utilisation du devis mixte a été exigeante, demandant beaucoup de temps et d'énergie pour la cueillette et l'analyse des données. De plus, la coordination de la collecte de données qualitative et les analyses reposaient essentiellement sur une seule personne, l'éudiante-chercheuse. Il a fallu étudier et se familiariser avec le devis d'étude longitudinale, le devis de groupes focus, les techniques d'analyse par régression logistique et par thématique inductive-déductive. Sans oublier, l'apprentissage de la combinaison des méthodes qualitative et quantitative pour former un tout cohérent (166).

Néanmoins, cette étude a permis d'identifier les facilitateurs et les obstacles influençant la consommation d'aliments traditionnels dans trois communautés cries du nord du Québec, Canada, tel que les projets environnementaux, les lois et régulations, les entreprises locales, le savoir traditionnel, l'influence des pairs, le statut d'emploi, la communauté de résidence et la commodité de consommation. L'utilisation du modèle écologique nous informe de l'importance des niveaux environnemental, communautaire et social. Malheureusement, la littérature scientifique semble porter plus d'intérêt aux facteurs individuels influençant la consommation alimentaire. Une meilleure documentation des facteurs environnementaux, communautaires et sociaux est souhaitable pour de futures recherches. Ainsi, les facteurs identifiés dans la phase qualitative pourraient éventuellement être validés à l'aide de recherche quantitative.

Promotion de l'alimentation traditionnelle et modèle écologique

Ce mémoire a comme autre objectif d'informer les équipes locales travaillant à la promotion et à la prévention des maladies chroniques et de leur fournir un outil pour le développement des stratégies pour la promotion de l'alimentation traditionnelle (164). La promotion d'aliments

traditionnels doit faire partie des stratégies de santé publique pour réduire les taux de maladies chroniques mais aussi pour améliorer le bien-être des populations autochtones. Les obstacles et les facilitateurs identifiés dans la présente étude peuvent être utilisés par des organisations politiques ou de santé publique pour promouvoir l'alimentation traditionnelle.

L'utilisation d'un modèle écologique a permis de dégager une vision globale des facteurs impliqués dans le choix de consommation des aliments traditionnels tout en permettant d'identifier comment chaque facteur influençait de façon positive ou négative. Cependant, quelques limitations doivent être soulignées. L'utilisation du modèle écologique ne permet pas de dégager les influences qui ont le plus de force, c'est-à-dire qu'il ne permet pas d'identifier les facteurs sur lesquels il est préférable d'agir pour avoir un impact important. Tel que mentionné par Sallis :

"*This put a greater burden on health promotion professional to identify critical factors for each behavioral application. A related weakness, is the lack of information about how broader levels of influence operate or how variables interact across levels. Thus, the models broaden perspective without identifying specific variables or providing guidance about how to use ecological models to improve research or intervention."(132, p. 480).*

En effet, les facteurs d'un modèle écologique sont faits d'interactions complexes entre les différents niveaux d'influence mais aussi entre facteurs; c'est pourquoi il est très difficile de les isoler *(128)*. Il faut savoir que plus le modèle est inclusif et présente des facteurs, plus il pose des difficultés opérationnelles. Toutefois, l'objectif étant d'améliorer la santé de la population par des actions diverses, intersectorielles et en amont des problèmes de santé, l'ajout de nouveaux facteurs suscitant des actions par des décideurs de différents domaines ne peut qu'être encouragé (128).

"The difficulty of implementing multi-level interventions should not be underestimated. The length of time required to change policies and environments is a deterrent to program directors who are called on to make changes to meet legislators' schedules or within grant

timelines. Most environmental variables and policies of interest are not controlled by health professionals, and change requires a political process. To implement multi-level interventions, public health professionals must become more skilled in advocacy and political change, or partner with those who have such skills"(132, p. 481-482).

Agir efficacement pour la promotion de l'alimentation traditionnelle prendra beaucoup de temps et d'énergie mais une approche multi-niveaux est essentielle afin d'intervenir efficacement.

Un des buts poursuivis dans l'élaboration de ce mémoire, en tant qu'agente de programmation en nutrition au Conseil cri de la santé, était de mieux comprendre le processus du choix d'aliments traditionnels pour dégager des stratégies d'intervention. C'est pourquoi 5 suggestions de priorités identifiées au cours de l'analyse des données et de l'interprétation des résultats sont inclus:

1. Améliorer le système présent voué à la préservation de la faune et flore;
2. Assurer l'accès à un territoire et de l'équipement de chasse pour tous les Cris;
3. Assurer le maintien du savoir traditionnel;
4. Évaluer le programme de promotion d'aliments traditionnels de Mistissini;
5. Permettre la vente d'aliments traditionnels aux entreprises locales et le service d'aliments traditionnels aux institutions gouvernementales (épiceries, restaurants, centres de soins longue durée, centres de la petite enfance, écoles).

Ces recommandations offrent une combinaison des facteurs agissant au niveau individuel et environnemental que l'on retrouve dans les modèles écologiques des facilitateurs et des obstacles. Ainsi, le programme de promotion de Mistissini a été identifié comme facilitateur et son évaluation pourrait permettre la reproduction du programme à d'autres communautés. Les autres recommandations répondent soit à des obstacles, par exemple l'absence d'aliments traditionnels dans les épiceries locales ou à des facilitateurs tels que l'accès à un territoire de

chasse. Il est à espérer qu'elles pourront être utiles aux équipes locales agissant à la promotion de l'alimentation traditionnelle (165). L'ordre de priorité ainsi que les stratégies d'action n'ont pas été suggérés puisqu'il appartient aux intervenants locaux, qui ont une meilleure connaissance du milieu et des stratégies à adopter, de prendre ces décisions et d'établir leur propre priorité d'action.

Une possible continuation de cette recherche pourrait documenter les stratégies d'interventions, identifier les indicateurs de mesure et évaluer leur impact sur la consommation d'aliments traditionnels.

En conclusion, les résultats de cette étude auront des conséquences immédiates dans la planification des programmes de prévention et de promotion en santé. La participation des communautés cries du Nord du Québec à l'élaboration des priorités et leur implication dans le processus de planification leur permettront d'occuper une place active dans la promotion de la consommation d'aliments traditionnels et l'adoption de saines habitudes alimentaires. En augmentant la consommation d'aliments traditionnels, nous réussirons à ralentir l'évolution des taux alarmants de maladies chroniques dans les populations autochtones et par le fait même réduire les inégalités de santé.

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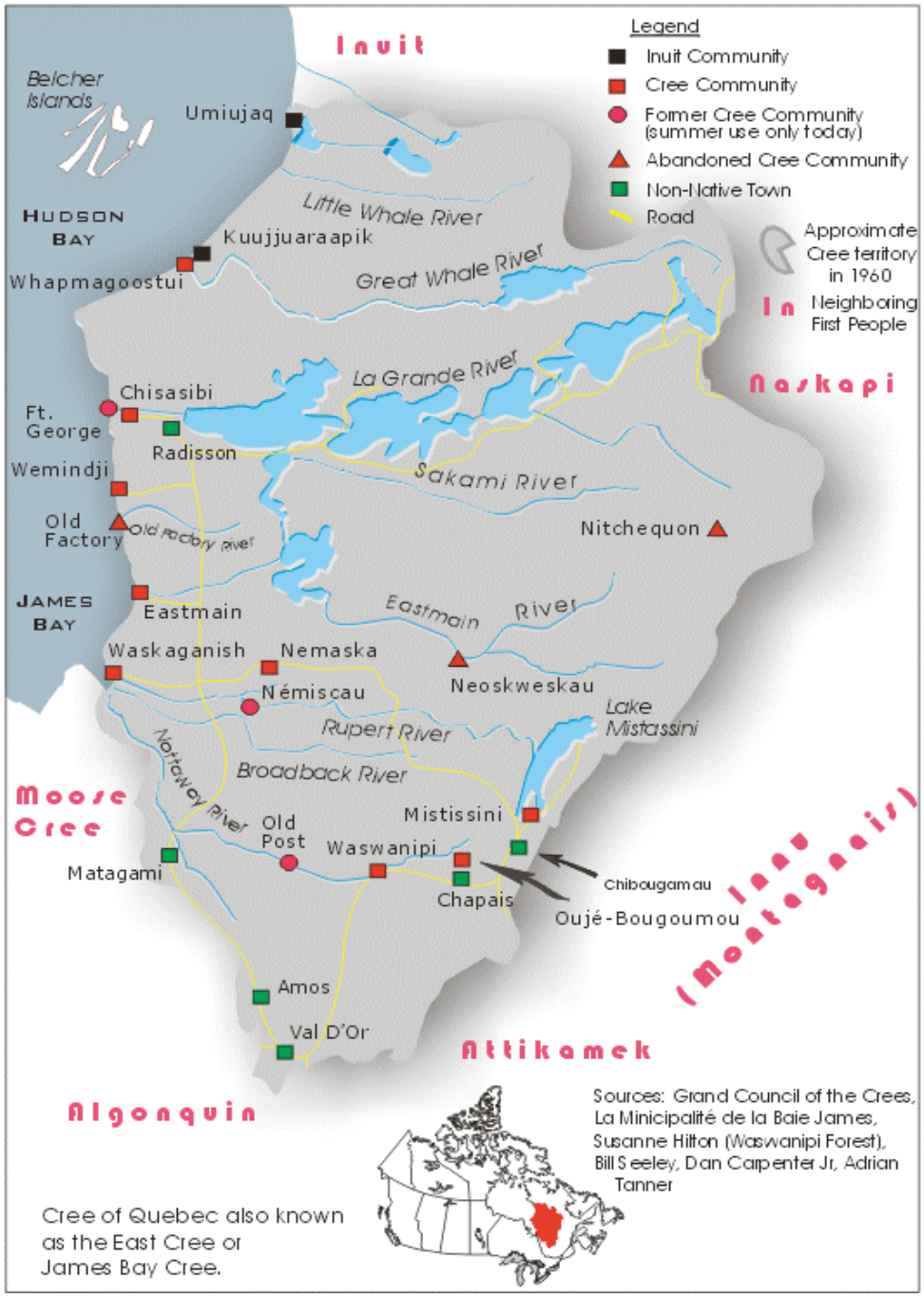
I. Annexe I - Carte géographique de la région

Carte Géographique Eeyou Itschee

Figure 3 Carte des terres cries de la Baie James (Eeyou Istchee)



II. Annexe II - Considérations éthiques

Formulaire de consentement pour « multi-community environment and health longitudinal study in Iiyiyiu Aschii »

Nituuchischaayihtitaau: Multi-Community Environment and Health Study in Iiyiyiu Istchee

Conseil Cri de la santé et des services sociaux de la Baie James
Cree Board of Health and Social Services of James Bay

CHUQ Centre hospitalier universitaire de Québec
McMaster University
McGill

Information Sheet and Consent Form (18 years old and over)

About the study

The Public Health Department wishes to ensure that Iiyiyiuch are protected from mercury and other contaminants in the environment. Contaminants are chemicals like mercury that may be in water, land, or food. This study looks at whether some kinds of contaminants may be harming people's health. It was developed to help your Chief and Council, and the Cree Board of Health, learn more about health and the environment. The study will:

- look at how healthy people are in Iiyiyiu Istchee
- check if Iiyiyiuch have been exposed to contaminants like mercury, lead, PCBs, and other contaminants
- try to understand the relationship between health, contaminants, and the kinds of foods people are eating.

The study is being done by the Public Health Department of the Cree Health Board. Some universities and research institutes are also partners in the project. The Chief and Council of your community support the study.

Who will be in the study

Over a 7-year period, this study will visit all Cree Nation communities. A total of approximately one thousand five hundred and sixty (1,560) people will be invited to participate. Pregnant women are not invited because they are already tested through the Maternal and Infant Health Programme.

What you will be asked to do

If you agree to be in the study, you will be asked to let a nurse do some health tests on you. You will also be asked to talk to an interviewer about your health and your eating habits. All told, this will take from three to four hours.

1. Health tests

The nurse will:

- Take a first blood sample (about six spoonfuls) from you before you have eaten. This blood will be tested to find out about your heart health, your thyroid health, your diet, whether you have contaminants in your body or have been affected by contaminants, and if you have ever had diseases given to you by animals.
- Ask you for a urine sample. This will be tested to find out about the health of your kidneys and your thyroid, and whether you have any contaminants in your body.
- Attach a small box called a "holter" to your chest to see how steady your heart rate is.
- Measure your height, your waist and hips, and your weight.
- Ask you to stand on a machine like a bathroom scale that measures how much muscle, fat, and water are in your body.
- Take your blood pressure.
- Take your temperature.

- Take a picture (ultrasound) of blood vessels in your neck and arm to check the health of your blood vessels, and a picture of your stomach to measure the fat.
- Take a toenail sample to test for selenium, a mineral found in the environment.
- Take a small hair sample (about the width of a pen) to test for mercury and arsenic.
- If you are a woman, ask some questions about your health.
- If you are a woman age 35 to 74, take a picture (ultrasound) of the bone of your heel to test the strength of your bones.

2. Interview

You will also be asked to respond to questions about your health, your lifestyle, your usual eating habits, and what you have eaten in the past day. This part will take about two hours. Later, on another day, some people will be again asked to tell what they have eaten.

It's your choice

You can decide whether you want to be in this study or not. And even if you agree to be in the study, you can change your mind later if you do not want to continue. What you decide will not have any effect on the health care that you receive.

Benefits of the study

If you take part in this study, you will be helping the Cree Health Board, and your Chief and Council, to know if contaminants are causing health problems in your community. They will also know more about how healthy people are, and how health care could be improved. Once we have the results of your medical tests, we can send them to your local clinic or to a doctor that you choose. You will get a letter telling you if your results are normal or not. It will tell you if there are problems that you should discuss with a doctor or nurse. We recommend that you consult your clinic if any of your results are abnormal.

If you decide to be part of the study, we will give you $30 to thank you for the time you are giving up. If you are one of the people who are asked to do a second interview about diet, you will receive an extra $10.

Risks of the study

We do not think that being in the study will cause you any harm. The tests do not hurt. But when you give your blood samples, you might develop a light bruise where the needle goes in. Also, you might feel tired after answering the interview questions.

The law makes health workers report some diseases when they find them. This applies to some of the diseases that are spread from animals to people. If your blood test shows that you have one of these diseases, we will tell your clinic and they will follow up with you.

What will be done with your blood, toenails, urine and hair samples

Some of your samples will be sent to the laboratory at Chisasibi Hospital and others will be sent to the Quebec National Public Health Institute (INSPQ) in Quebec City. Your samples will be tested to find out about heart and thyroid health, contaminants in your body, how your body reacts to environmental contaminants, things in your diet that protect your health, and if you have ever had diseases given to you from animals. Together, these results will tell about the state of your health, including your heart. The results will be used in the study. Your blood and urine samples will be kept frozen for the Cree Health Board in a -80°C freezer in the laboratory of Dr. Éric Dewailly (CHUQ-CHUL), for 15 years. That way they will still be there later if the Cree Health Board needs to test your blood and urine for something new. But no new tests will be done on your samples unless you sign a paper agreeing to them.

How we will keep your information private

None of the information that you provide for this study will be made public. Your results and samples will be labelled with a number, not your name. There will be strict rules about who can see the "Master List" that matches names
and study numbers. The Master List will be destroyed at the same time as all samples.

How you can find out about the results of the study
We will prepare reports to tell people in the community what the study found out. These reports will describe the results for the community as a whole. Your name will not appear in any report. You can ask to have a copy of the report mailed to you when it is ready.

Who is doing the study:
This study is being done by the Public Health Department of the Cree Health Board. Partners in the study are:

- The Chief and Council of your community and the communities already visited
- the Quebec National Institute of Public Health
- Laval University Hospital (CHUQ-CHUL)
- McMaster University
- McGill University

The money for the study comes from the new Mercury Agreement (2001), which funds the Health Board to make sure that people are protected from mercury and other contaminants. The money is coming through Niskamoon Corporation.
The study has been approved by the Research Ethics Committees of Laval University Hospital (CHUQ-CHUL) and McGill University, and shared with that of McMaster University; as well as by the Research Committee of the Cree Board of Health and Social Services.

For more information:
If you have any questions about the project, you can contact:

Ms. Jill Torrie Permanent Secretary of the Research Committee	Cree Board of Health and Social Services [redacted]
Ms. Suzanne Côté Field coordinator and nurse	Public Health Research Unit, Laval University [redacted]
Dr. Éric Dewailly Principal researcher	National Quebec Public Health Institute Professor, Laval University [redacted]
Professor Evert Nieboer Principal researcher	Professor, McMaster University ([redacted]
Dr Grace Egeland Principal researcher	Professor, McGill University [redacted]

If you have any concerns about your participation, questions or complaints, you can call or write to:
The Cree Nation representative to the Cree Board of Health and Social Services
c/o Office of the Chief of your Cree Nation

or
Ms. Ann-Marie Awashish, Commissioner of Complaints (reporting to the Board of Directors)
Cree Board of Health and Social Services of James Bay
[redacted]

Moreover, if you have questions concerning your rights as a subject of research, you can contact the Director of Professional Services of CHUQ-CHUL at the following number; [redacted]

CONSENT FORM TO PARTICIPATE IN NITUUCHISHAAYIHTITAAU ISTCHEE (18 years old and over)

I have read and understand what is involved in the study. I know that I can choose whether to be in the study or not. I agree to participate in the Nituuchischaayihtitaau: Multi-Community Environment and Health Study in Iiyiyiu Istchee.

Yes ☐ **No** ☐

I would like the Cree Health Board to send the results of my clinical tests to my local clinic (or to the doctor of my choice) to be placed in my file. I will receive a letter telling me if my results are normal or not, and if I should talk to a doctor about them.

Yes ☐ **No** ☐

The doctor of my choice is (If other than a doctor at my local clinic): Name _____

Address_____

Other choices (You do not need to agree to any of these to be in the study)

I agree to allow a research nurse to review my medical file to find out about my health.

Yes ☐ **No** ☐

I agree that the researchers can contact me for follow-up tests and for other analyses not mentioned above.

Yes ☐ **No** ☐

I would like to receive a short report of the study's results.

Yes ☐ **No** ☐

_____	_____	_____
Name of participant	Signature	Date yy/mm/dd
_____	_____	_____
Name of witness	Signature	Date yy/mm/dd
_____	_____	_____
Name of principal investigator or his/her designated representative	Signature	Date yy/mm/dd

Participant's initials_____ Witness' initials_____

Formulaire de consentement pour la participation aux groupes focus

Université de Montréal

Conseil Cri de la santé et des services sociaux de la Baie James
ᓂᐯᓂᔅᑭᒡᐃᐧᐣ ᑲᓇᑕᓂᑯᓐ ᐊᑕᐦᐃᑲᓇᐧᐣ ᐊᓂᔑᓇᐯᒧᐎᓐ ᐊᓐᓇᑲᒋᑕᓂᐊᓐᐠ
Cree Board of Health and Social Services of James Bay

ᓂᐲᔥᑎᓯᒪᔨᑎᒻᒥᐧᐣ ᐊᓂᔑᓇ
Let's learn about our land
Let's learn about ourselves

Consent Form

We invite you to read this form carefully and ask questions before you sign it.
Project Title: Factors associated to Bush foods consumption in Cree communities, Northern Québec.

Véronique Laberge Gaudin, Dietician
Nutrition Program Officer
Public Health Department
Cree Board of Health
Mistissini (Qué)
[redacted]

Louise Potvin, Ph.D.
Research Supervisor
Département de médecine sociale et préventive
Université de Montréal
[redacted]

Olivier Receveur, Ph.D.
Research Co-supervisor
Département de Nutrition
Université de Montréal
[redacted]

Leah Walz, Ph.D., post-doc candidate
Research Co-supervisor
Département de médecine sociale et préventive
Université de Montréal
P.O. Box 6128, Postal Station. CV

[redacted]

Funding body: Cree Board of Health and Social Services of James Bay (CBHSSJB), and the Ministry of Health & Social Services of Québec (MHSSQ)

Project Description:

- Nature and objectives of the project: This research regards factors influencing the consumption of bush foods. It includes discussion groups, called focus group, involving about fifty Cree resident of *Eeyou Aschii* (Cree land). The objective of the discussion groups is to complete, enrich and clarify factors related to bush foods eating.
- Description: the research aims to describe factors associated to Cree bush foods consumption in order to promote healthy lifestyles.

Procedures

- Nature of the participation: Participants agree and accept to be part of a semi-directive focus group discussing factors influencing the consumption of bush foods
- Location, duration and number of sessions: The discussion groups are held in a location agreed upon by participants and the researcher. The duration of the group discussion is about 90 minutes, with a possibility to extend it. One single session per participant is planned.
- Inclusion and exclusion criteria: Respondents are selected based on their knowledge regarding the subject of the research as well as their age, place of residence and if they practice hunting.
- Number of participants: About six to eight participants in a discussion group. A total of fifty will participate.
- Audio recording and duration of its conservation: Discussion groups will be recorded on a numerical device, transferred on computer and kept as audio or transcript form. Transcripts will be printed on paper. Audio recordings will be destroyed within few months following group discussions and after their transfer on computer. Rest of documents will be kept for a maximum of seven years after interview under lock in the researcher's office.

Advantages and benefits:

- By describing factors linked to bush foods eating we think we can improve the promotion of traditional foods consumption an eventually increase *miyupimaatisiiun* in *Eeyou Aschii*.
- For the science: a better knowledge of factors associated to the consumption of Bush foods.

Once the research is over, if you request it, we could forward you the results.

Disadvantages and risks:

- There are no known or foreseeable physical or psychological risks. The only foreseeable disadvantage is the time the respondent dedicates to the group discussion.

Confidentiality:

- Planned modalities: Participants accepts that the content of the group discussion is used as documentary source for the study. Only the researchers and their assistants will have access to the interview documents. In any eventual publication (or circulation of any other nature), the respondent's anonymity will be protected, so much so that his/her name, functions and title will not be associated to the content of the interview and no excerpt will be attributed to the respondent. In Moreover, the coding of the interview will keep the respondent's anonymity.
- Destruction of data: Audio recordings and transcripts (electronic and hard copy) will be destroyed after seven years.

"However, for research project control purposes your file may be consulted by a person mandated by the Ethics Research Committee from the Faculty of Medicine of University of Montréal (the *CERFM*). All accede to a policy of confidentiality".

Compensation:

The respondent will receive a compensation of $50 for participating in group discussion.

Possibility to be suspended from the study

Your participation to this study may be interrupted by the researcher if he or she believes it is in your best interest, or for any other reason.

Freedom of participation and freedom of withdrawal from the study

Your participation to the study is totally voluntary. Therefore, you are free to accept or refuse to participate to it, and you can withdraw from the study at any time without providing any reason. This will have no impact on the health treatments you are entitled to and it will not harm your relationship with your doctor, nurses, nutritionist or other interveners.

Resource person:

For the research: Véronique Laberge Gaudin (Cf. coordinates page 1)

Any complain regarding your participation to this research can be forwarded to the ombudsman of the University of Montréal at [redacted] (the ombudsman accepts collect calls) or emailed [redacted]

Participation to the project and signatures

I have read and understood the present form. I certify that it was explained to me verbally. I have had the opportunity to ask all the questions regarding the research project and they were answered to my satisfaction. I certify that I was given all the needed time to think and make my decision. I know that I can withdraw at any time.

I, the undersigned, accept to participate to this study:

_____	_____	_____
Participant name	Signature	Date

I certify that a) I have explained to the participant the terms of the present consent form; b) I have clearly indicated to the participant that he or she remains free to end his/her participation to the present project at any time and that I will hand him/her a signed copy of the present form.

_____	_____	_____
Véronique Laberge Gaudin	Signature	Date

Administrative information:

- The form's original will be kept in the Cree Public Health Department of the Cree Board of Health and Social Services of James Bay and one signed copy will be handed to the participant.
- The research project and the present consent form were approved by the *CERFM* on March 23, 2009.
- Reference №: *CERFM* (8) #333 March 23, 2009

III. Annexe III - Outils pour collecte des données

Questionnaire de fréquence des aliments traditionnels provenant de « multi-community environment and health longitudinal study in Iiyiyiu Aschii »

Traditional Food Frequency

Questionnaire

Dates for Seasons	
Fall	**21 September to 20**
Winter	**21 December to 20 March**
Spring	**21 March to 20 June**
Summer	**21 June to today**
Codes for Frequency	
D	**Day**
W	**Week**
M	**Month**
S	**Season**
Codes for Portion Size Model	
See Santé Québec Kit	
Codes for Thickness	
See Santé Québec Kit	

0. Start time

|__|__|:|__|__|
HH MM

In the past 12 months, did you eat any of the following Animals? If yes, how often did you eat these Animals for each of the following seasons and what is your usual portion size?													
Animals	Eaten		Fall		Winter		Spring		Summer		Usual Portion		
	Yes	**No**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Quant.**	**Mod.**	**Thick.**
Bear meat, dry or smoked	☐	☐											
Bear meat, cooked	☐	☐											
Bear liver or kidney	☐	☐											
Moose meat, dry or smoked	☐	☐											
Moose meat, cooked	☐	☐											
Moose liver or kidney	☐	☐											
Caribou meat, dry or smoked	☐	☐											
Caribou meat, cooked	☐	☐											
Caribou liver or kidney	☐	☐											
Beaver meat	☐	☐											
Rabbit meat	☐	☐											
Any other Game Animals that you eat? **(specify on line)**													
_____	☐	☐											

In the past 12 months, did you eat any of the following Fish? If yes, how often did you eat these Fish for each of the following seasons and what is your usual portion size?

Fish	Eaten		Fall		Winter		Spring		Summer		Usual Portion		
	Yes	**No**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Quant.**	**Mod.**	**Thick.**
Speckled trout	☐	☐											
Walleye	☐	☐											
Whitefish	☐	☐											
Pike	☐	☐											
Lake Trout	☐	☐											
Sturgeon	☐	☐											
Burbot	☐	☐											
Red or White Sucker	☐	☐											
Fish from the ocean	☐	☐											
Fish eggs	☐	☐											
Any other Wild Fish that you eat? **(specify species on line)**													
_____	☐	☐											
_____													
_____													
Do you eat Fish liver? (specify species on line)													
_____	☐	☐											

In the past 12 months, did you eat any of the following Birds and Ducks? If yes, how often did you eat these Birds and Ducks for each of the following seasons and what is your usual portion size?

Birds and Ducks	Eaten		Fall		Winter		Spring		Summer		Usual Portion		
	Yes	**No**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Quant.**	**Mod.**	**Thick.**
Loon or Merganser	☐	☐											
Geese (all types)	☐	☐											
Dapplers (Mallard, American Black duck and Northern Pintail)	☐	☐											
Sea Ducks (Golden eye, Old Squaw and Black Scoter)	☐	☐											
Other Ducks	☐	☐											
Ptarmigan, partridge and other birds	☐	☐											
Do you eat Bird and Duck gizzards? **(specify species on line)**													
_____	☐	☐											
_____													
_____													
_____													
Do you eat Bird and Duck livers or kidneys? **(specify species on line)**													
_____													
_____													

In the past 12 months, did you eat any Wild Berries or Wild Berry Jam? If yes, how often did you eat Wild Berries or Wild Berry Jam for each of the following seasons and what is your usual portion size?

Berries	Eaten		Fall		Winter		Spring		Summer		Usual Portion		
	Yes	**No**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Quant.**	**Mod.**	**Thick.**
Wild berries	☐	☐											
Wild berry jam	☐	☐											

In the past 12 months, did you use any of the following Animal Fats for spreading, dipping, baking or frying? If yes, how often did you use these Animal Fats for each of the following seasons and what is your usual portion size?

Animal fats	Eaten		Fall		Winter		Spring		Summer		Usual Portion		
	Yes	**No**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Freq.**	**D-W-M-S**	**Quant.**	**Mod.**	**Thick.**
Bear grease	☐	☐											
Goose grease	☐	☐											
Do you use other Animal Fats for spreading, dipping, baking or frying? **(specify on line)**													
_____	☐	☐											
_____													

Thank you for your participation!

The interview was held in:

1 ☐ English

2 ☐ Cree

3 ☐ Both English and Cree

Name of interviewer

_____

Date of interview

|___|___|___|___| |___|___| |___|___|
YYYY MM DD

End time

|___|___|:|___|___|
HH MM

End of Traditional Food Frequency questionnaire

Questions sélectionnées pour les variables indépendantes à partir du questionnaire individuel provenant de « multi-community environment and health longitudinal study in Iiyiyiu Aschii »

Individual

Questionnaire

Gender

1 ☐ Female
2 ☐ Male

What is your birth date?

|___|___|___|___| |___|___| |___|___|
YYYY MM DD

9999 ☐ DNK/NR/R

How old are you?

_____ years old

99 ☐ DNK/NR/R

What language, or languages, do you usually speak at home?

Check all that apply

1 ☐ Cree
2 ☐ English
3 ☐ French
9 ☐ DNK/NR/R

What is the highest level of schooling you have completed?

1 ☐ No formal schooling
2 ☐ Some or completed elementary school
3 ☐ Some or completed secondary school
4 ☐ Some or completed college or higher education level (not university)
5 ☐ Some or completed university
9 ☐ DNK/NR/R

Can you tell me the last grade or year of school you have completed?

_____ grade level

Which of the following best describes your present working status?

1 ☐ Work full time
2 ☐ Work part time
3 ☐ Work occasionally
4 ☐ Student
5 ☐ Housework
6 ☐ Retired or on pension
7 ☐ Unemployment insurance
8 ☐ Income Security Program
9 ☐ Social welfare
10 ☐ Not working for health reasons & b) Specify: _____
11 ☐ Other & b) Specify: _____
99 ☐ DNK/NR/R

How many persons of each of the following age groups live in your house or apartment at this time?

Give an answer for each item

a) Children aged 14 yrs or less:	# _____	14-	99 ☐ DNK/NR/R
b) Adults aged 15 to 49 yrs:	# _____	15-49	99 ☐ DNK/NR/R
c) Adults aged 50 yrs or more:	# _____	50+	99 ☐ DNK/NR/R

Do you smoke cigarettes?

1 ☐ Every day &
b) How many cigarettes do you smoke per day? _____ # of

2 ☐ Occasionally &
b) How many cigarettes do you smoke per week? _____ # of
3 ☐ Ex-smoker
4 ☐ Never
9 ☐ DNK/NR/R

Do you hunt?

1 ☐ Yes
2 ☐ No ▸
9 ☐ DNK/NR/R ▸ Go to Q 0

I am going to ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Think about the activities you do at work, as part of your house and yard work, to get from place to place, while in the bush or during sport activities.

Now think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for exercise.

During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

_____ days per week ▸ **If "0" write "0" and Go to**

8 ☐ DNK/not sure ▸
9 ☐ Refused ▸ **Go to Intro Q 0**

Clarification: Think only about the walking you do for at least 10 minutes at a time

An average time for one of the days on which the respondent walks is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask:

What is the total amount of time you spent walking over the last 7 days?

_____ hours per week
_____ minutes per week
998 ☐ DNK/not sure
999 ☐ Refused

Intro Q 0: Now, think about all the vigorous activities which take hard physical effort that you did in the last 7 days. Vigorous activities make you breathe much harder than normal and may include heavy lifting, digging or running. Think only about those physical activities that you did for at least 10 minutes at a time.

During the last 7 days, on how many days did you do vigorous physical activities?

_____ days per week ▸ — **If "0" write "0" and Go to Intro**

8 ☐ DNK/not — **Go to Intro Q 0**

9 ☐ Refused ▸ —

Clarification: Think only about those physical activities you do for at least 10 minutes at a time

How much time did you usually spend doing vigorous physical activities on one of those days?

_____ hours per day ▸ — **Go to Intro Q 0**

_____ minutes per day ▸ —

998 ☐ DNK/not sure

999 ☐ Refused ▸ — **Go to Intro Q 0**

Clarification: Think only about those physical activities you do for at least 10 minutes at a time

An average time for one of the days on which the respondent does vigorous activity is being sought. If the respondent can't answer because the pattern of time spent varies widely from day to day, ask:

How much time in total would you spend over the last 7 days doing vigorous physical activities?

_____ hours per week

_____ minutes per week

998 ☐ DNK/not sure

999 ☐ Refused

Intro Q0: Now think about activities which take moderate physical effort that you did in the last 7 days. Moderate physical activities make you breathe somewhat harder than normal and may include carrying light loads, traditional dancing and activities while in the bush. Do not include walking. Again, think about only those physical activities that you did for at least 10 minutes at a time.

During the last 7 days, on how many days did you do moderate physical activities?

_____ days per week ▸ — **If "0" write "0" and Go to**

8 ☐ DNK/not sure ▸ — **Go to Clinical questions**

9 ☐ Refused ▸ —

Clarification: Think only about those physical activities you do for at least 10 minutes at a time

How much time did you usually spend doing moderate physical activities on one of those days?

_____ hours per day ▸ — **Go to Clinical questions**

_____ minutes per day ▸ —

998 ☐ DNK/not sure

999 ☐ Refused ▸ — **Go to Clinical questions**

Clarification: Think only about those physical activities you do for at least 10 minutes at a time

An average time for one of the days on which the respondent does moderate activity is being sought. If the respondent can't answer because the pattern of time spent varies widely from day

What is the total amount of time you spent over the last 7 days doing moderate physical

_____ hours per week

_____ minutes per week

998 ☐ DNK/not sure

Clinical questions

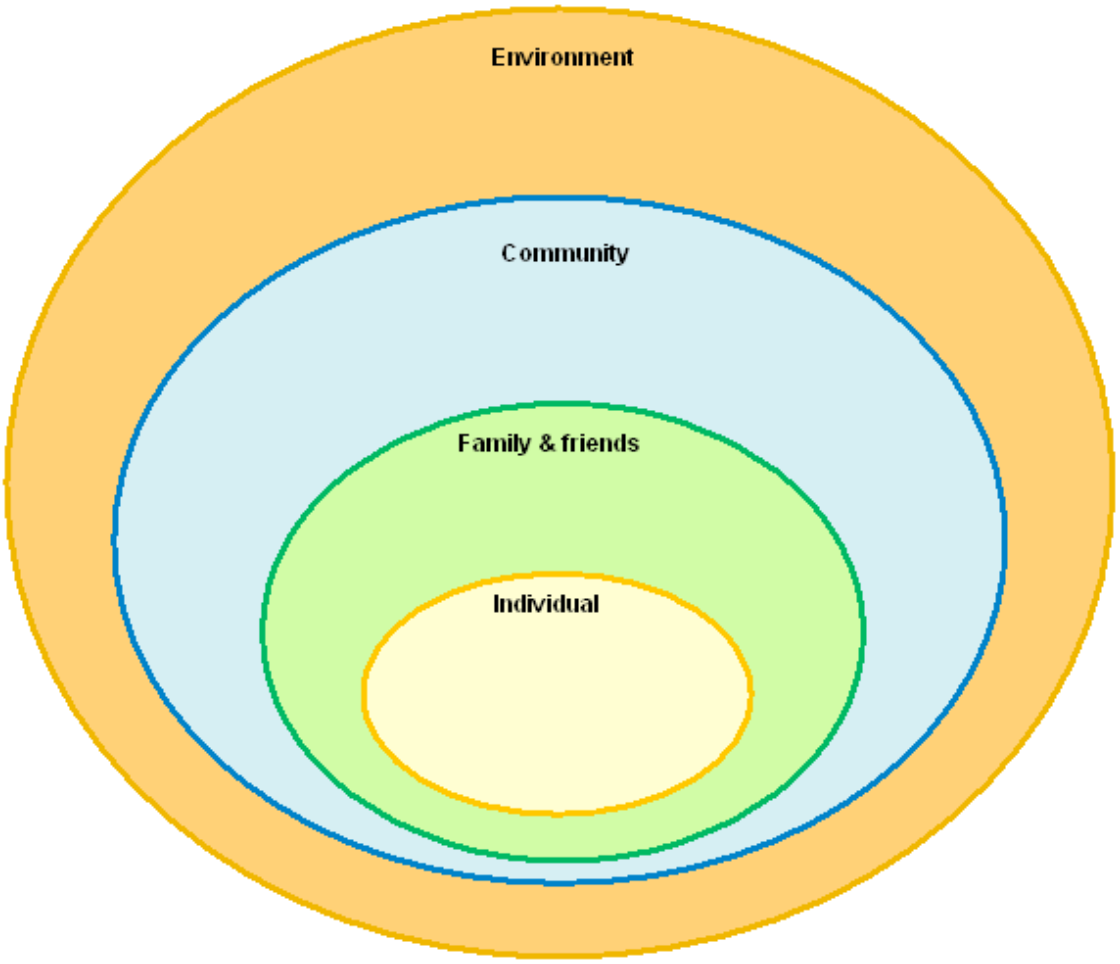
In general, would you say your health is…

1 ☐ Excellent
2 ☐ Very Good
3 ☐ Good
4 ☐ Fair
5 ☐ Poor
9 ☐ DNK/NR/R

Are you worried about the pollution of the environment (land, water or air) in Iiyiyiu Aschii?

1 ☐ Not at all
2 ☐ Somewhat
3 ☐ Fairly
4 ☐ Very much
9 ☐ DNK/NR/R

Outils visuels utilisés durant les groupes focus



People 40 y.o. & +	eat 4.3 times more Bush food	than 39 y.o & -
Hunters	eat 3.6 times more Bush food	than non-hunter
Mistissini	eat 3.6 times more Bush food	than Eastmain
	eat 2.3 times more Bush food	than Wemindji
Walking 30 min/ day	eat 2.2 times more Bush food	than walking less 30 min/day
No schooling or elementary	eat 5 times more Bush food	College or University

No difference between:

Smoker	**&**	**No-smoker**
People non-obese	**&**	**Obese**
Employed	**&**	**Non-employed**
People who worry about contaminants	**&**	**People who don't worry**
People feeling healthy	**&**	**People feeling unhealthy**
People speaking Cree at home	**&**	**Speaking English at home**
People who leave in large households	**&**	**in small households**

IV. Annexe IV - Résultats supplémentaires

Chi-carré des variables indépendantes avec variable dépendante

Tableau I Tableaux croisés des facteurs à l'étude avec la consommation hebdomadaire d'aliments traditionnels provenant de « multi-community environment and health longitudinal study in Iiyiyiu Aschii » (n=374)

INDEPENDANT VARIABLES		WEEKLY FREQUENCY		p*
		Less than 3 times	3 times or more	
Community	Mistissini (n= 156)	47.4%	52.6 %	<0.001
	Wemindji (n= 126)	63.5%	36.5 %	
	Eastmain (n= 92)	73.9%	26.1 %	
Sex	Female (n= 224)	64.7 %	35.3 %	0.010
	Male (n=150)	51.3 %	48.7 %	
Age	18-39 y.o. (n= 235)	74.0 %	26.0 %	<0.001
	40-90 y.o. (n= 139)	34.5%	65.5 %	
BMI	18.5 -24.99 (n= 27)	63.0 %	37.0 %	0.667
	25 – 29.99 (n= 86	62.8 %	37.2 %	
	30 et + (n= 261)	57.9 %	42.1 %	
Smoke	Smoker (n=187)	69.5 %	30.5 %	<0.001
	No-Smoker (n= 187)	49.2 %	50.8 %	
Health Perception	Excellent to very good (n= 98)	59.2 %	40.8 %	0.385
	Good (n= 176)	62.5 %	37.5 %	
	Fair to poor (n=100)	54.0 %	46. 0 %	
Worried about pollution	Not at all (n=86)	64.0 %	36.0 %	0.449
	Somewhat and fairly (n= 166)	56.0 %	44.0 %	
	Very much (n=122)	60.7 %	39.3 %	
Employment Status	Employed (n= 255)	65.1 %	34.9 %	0.001
	No-employed (n= 119)	47.1 %	52.9 %	
Education	No formal schooling / some or completed elementary school (n= 75)	21.3%	78.7 %	<0.001
	Some or completed high school (n= 220)	70.0 %	30.0 %	
	Some or completed college/ University (n= 79)	65.8 %	34.3 %	
Hunters	Yes (n= 180)	46.7 %	53.3 %	<0.001
	No (n= 194)	71.1 %	28.9 %	
Daily walking	Less than 30 minutes (n= 174)	64.9 %	35.1 %	0.040
	More than 30 minutes (n= 200)	54.5 %	45.5 %	
English language spoken at home	No English (n= 187)	55.1 %	44.9 %	0.092
	English (n= 187)	63.6 %	36.4 %	
Household	1 to 4 persons (n=159)	56.6 %	43.4 %	0.351
	5 persons or more (n=215)	61.4 %	38.7 %	

*p value for chi-square

Chi-carré des variables indépendantes

Tableau II Distribution croisée (en %) des variables indépendantes à l'étude provenant de « multi-community environment and health longitudinal study in Iiyiyiu Aschii », 2005 et 2007 (n=374)

		Gender		Age		BMI		Smoke		Health Perception			Worried pollution			Job status		Education			Hunter		Walk		English		# Pe
		F	M	18-39	40-90	18.5-29	30 - +	S	No-S	Ex	Good	Poor	No	S-fairly	VM	Job	No job	None	H-S	U	Y	N	-30	+30	N	Y	
1	**Community**																										
	Mistissini (n= 156)	62.2	37.8	62.8	37.2	33.3	66.7	50.6	49.4	23.1	48.7	28.2	27.6	53.8	18.6	64.1	35.9	28.2	51.3	20.5	47.4	52.6	46.8	53.2	50	50	4.6(2.1)
	Wemindji (n= 126)	54.8	45.2	64.3	35.7	30.2	69.8	48.4	51.6	22.2	54.8	23	13.5	34.9	51.6	63.5	36.5	15.1	60.3	24.6	54.8	45.2	43.7	56.3	46.8	53.2	5.1(2.3)
	Eastmain (n= 92)	63	37	60.9	39.1	25	75	51.1	48.9	37	33.7	29.3	28.3	41.3	30.4	81.5	18.5	13	69.6	17.4	40.2	59.8	50	50	54.3	45.7	5.5 (2.4)
		p=0.350		p=0.876		p=0.386		p=0.907		p=0.021			p <0.001			p=0.007		p=0.008			p=0.102		p=0.647		p=0.548		p=0.013
2	**Gender**																										
	Female (n= 224)			63.8	36.2	27.2	72.8	52.2	47.8	25	47.3	27.7	21.9	45.5	32.6	68.3	31.7	21.9	55.4	22.8	18.8	81.2	46.9	53.1	47.3	52.7	5.1(2.2)
	Male (n=150)			61.3	38.7	34.7	65.3	46.6	53.3	28	46.7	25.3	24.7	42.7	32.7	68	32	17.3	64	18.7	92	8	46	54	54	46	4.9(2.3)
		---		p=0.623		p=0.125		p=0.291		p=0.778			p=0.790			p=0.951		p=0.249			p <0.001		p=0.868		p=0.205		p=0.477
3	**Age**																										
	18-39 y.o.(n = 235)					31.1	68.9	64.7	35.3	23.8	50.2	26	25.1	47.2	27.7	73.6	26.4	8.1	69.4	22.4	44.3	55.7	45.5	54.5	47.7	52.3	5.3(2.1)
	40-90 y.o. (n= 139)					28.8	71.2	25.2	74.8	30.2	41.7	28.1	19.4	39.6	41	59	41	40.3	41	18.7	54.7	45.3	48.2	51.8	54	46	4.5(2.3)
				---		p=0.642		p <0.001		p=0.242			p=0.028			p <0.001		p <0.001			p=0.051		p=0.617		p=0.239		p=0.002
4	**BMI**																										
	18.5-29.99 (n=113)							55.8	44.2	38.9	46	15	24.8	42.5	32.7	63.7	36.3	21.2	53.1	25.7	49.6	50.4	35.4	64.6	50.4	49.6	4.7(2.2)
	30 et + (n= 261)							47.5	52.5	20.7	47.5	31.8	22.2	45.2	32.6	70.1	29.9	19.5	61.3	19.2	47.5	52.2	51.3	48.7	49.8	50.2	5.1(2.3)
						---		p=0.143		p <0.001			p=0.836			p=0.223		p=0.273			p=0.716		p=0.005		p=0.91		p=0.073
5	**Smoke**																										
	Smoker (n=187)									27.7	49.2	25.1	27.3	40.1	32.6	70.1	29.9	8.6	72.7	18.7	45.5	54.5	42.8	57.2	47.1	52.9	5.5(2.4)
	No-Smoker(n=187)									26.7	44.9	28.3	18.7	48.7	32.6	66.3	33.7	31.6	44.9	23.5	50.8	49.8	50.3	49.7	52.9	47.1	4.5(2)
								---		p=0.682			p=0.104			P=0.437		p <0.001			p=0.301		p=0.147		p=0.255		p <0.001
6	**Health Perception**																										
	Excel – (n=98)												30.6	36.7	32.7	69.4	30.6	24.5	52	23.5	45.9	54.1	41.8	58.2	56.1	43.9	5.2(2.6)
	Good (n= 176)												20.5	50	29.5	72.2	27.8	18.2	60.8	21	49.9	50.6	41.5	58.5	44.3	55.7	4.9(2.2)
	Poor (n=100)												20	42	38	60	40	19	62	19	48	52	60	40	54	46	5.1(2)
										---			p=0.115			P=0.109		p=0.583			p=0.855		p=0.007		p=0.112		p=0.529
7	**Worried pollution**																										
	Not at all (n=86)															54.7	45.3	24.4	68.6	7	50	50	37.2	62.8	72.1	27.9	5.4(2.5)
	Somewhat (n= 166)															73.5	26.5	21.2	56.6	22.3	46.4	53.6	49.4	50.6	48.2	51.8	5(2.1)
	Very much (n=122)															70.5	29.5	15.6	54.9	29.5	49.2	50.8	49.2	50.8	36.9	63.1	4.7(2.3)
													---			p=0.008		p=0.003			p=0.828		p=0.143		p <0.001		p=0.094

8	**Employment**																									
	Employed (n= 255)																9.2	63.5	26.7	45.5	54.5	46.7	53.3	42.7	57.3	5.2(2.2)
	Not (n= 119)																42.0	48.7	9.2	53.8	46.2	46,2	53.8	65.5	34.5	4.6(2.3)
																---	p <0.001			p=0.135		p=0.935		p <0.001		p=0.016
9	**Education**																									
	No school \ (n= 75)																			50.7	49.3	50.7	49.3	77.3	22.7	4.3(2.3)
	high s (n= 220)																			48.2	51.8	45	55	49.1	50.9	5.4(2.2)
	Col / Univ(n= 79)																			45.6	54.4	46.8	53.2	26.6	73.4	4.5(2.1)
																	---			p=0.818		p=0.696		p <0.001		p <0.001
10	**Hunters**																									
	Yes (n= 180)																					46.1	53.9	55	45	4.9(2.4)
	No (n= 194)																					46.9	53.1	45.4	54.6	5.1(2.1)
																				---		p=0.877		p=0.062		p=0.632
11	**Walk per day**																									
	- 30 min (n= 174)																							51.1	48.9	5.1(2.3)
	+ 30 min (n= 200)																							49	51	4.9(2.2)
																						---		p=0.678		p=0.532
12	**English language spoken at home**																									
	No Eng (n= 187)																									5.3(2.3)
	English (n= 187)																									4.7(2.1)
																								---		p=0.029

Légende : Les « p value » soulignés en turquoise foncé sont statistiquement significatifs avec un alpha de 5 %

Les « p value » soulignés en turquoise pâle sont statistiquement significatifs avec un alpha de 15 %

Interprétation qualitative des résultats quantitatifs non présentés dans le premier article scientifique

Tableau III Commentaires des participants des groupes focus à propos des résultats quantitatifs qui n'ont pas été inclus dans le premier article scientifique

Variables	**Participant's explanation**	**Quotation**
AGE	Participants **agree** with the association	*"The elders are more used to eating traditional food."*
SEX	Participants **agree** with the association	---
Daily walking	Participants **agree** with the association	*"I guess people that are more traditional oriented, eat more food and walk more."*
Hunter	Participants **agree** with the association	*"Because they kill the food and they have it and eat it. Because if you kill it and don't eat it is almost if (inaudible) I think it is only hunters that eat those pieces… They are more in the traditional setting hunters."*
Smoking	Participants **agree** with the non-association.	*"It doesn't really make a difference on how much a person eats traditional Cree food if they smoke or if they don't smoke. They eat the same quantity of traditional Cree food – the smokers and the non-smokers."*
English spoken at home	1. Some participant **agree** with the non-association 2. Some participant **disagree**	*1."We eat a lot of traditional food at home and we speak English.* ***So, there's no difference?*** *There's a lot of families that speak English."* *2."That's so difficult to accept that traditional food that there would be no difference. I think that people that speak Cree at home would intend to eat more traditional food, that's what I think. But a lot of the people that speak english would have more access to traditional food because of money"*
# People in household	Participant **agree** with the non-association	*"Because there could be 2 elders living in a large home and 2 elders living in a small home and the rest would be non traditional food as of a large family, Crees are able to fix different foods all at the same time …"*

Citations associées pour chaque facteur facilitateur et obstacle

Tableau IV Citations associées à chaque facilitateur identifié

FACILITATORS			
		Facilitators	Examples
INDIVIDUAL	Generation	Being older	*"I think the age too like I have brothers and sisters like the older ones eat all the traditional foods and the younger ones are like one is 17 and 16 they don't really eat it"* *"The elders are more used to eating traditional food."* *"Older people eat more traditional food."*
	Lifestyle	Being a hunter	*"Because they (hunters) kill the food and they have it and eat it... I think it is only hunters that eat those pieces… They are more in the traditional setting hunters"*
		Going to the bush	*"I do, I would say I eat more traditional food when I am in the bush because it feels more traditional that way (laughing). I don't really eat it here when I am in Mistissini when like my family my mom they don't really cook it and so do I. I mostly cook moose meat so for me there is a separation from bush life and where I live. When I live in a tent or when I live in a house (laughing)"*
		Being physically active	*" People that move around get hungry more so they eat very well. People that don't move around as much don't eat as much."* *"And those people who actually have to get their food are used to walking and getting it helps a lot more"* *"I guess people that are more traditional oriented eat more food and walk more. Because if you want to eat, you drive to the store. And then you drive home. Whereas a hunter would go. Go and hunt. Walk. Check the snares. You have to race - run after a moose."*
	Preferences	Like traditional food	*"Oh well it is really good I really like it I don't know all meat but I really like goose, moose and sometimes beaver"* *"I eat it because I like it"* *"You know what I mean everybody eats traditional food but they have their own preference what traditional food is."*
		Generates good memories	*"Yes it is healthy because it brings back memories of things in my childhood or the bush"* *"It also reminds me of my grandparents because they always had it whenever I went to go and live with them they would always have some of traditional food like whenever I have the food like during holidays it always reminds me of them my grandparents"*
		Cravings	*"sometimes it happens when you have this craving there is no way, you can't find any traditional food?"* *"Sometimes I get tired of eating non-traditional food"*
	Cree Identity	Being proud of Cree traditional food	*"I am proud to, of my elders to go there to. How they work hard to promote or our traditional cooking, they do Sigabone, they smoke."* *"And I think also like it influenced me more to be more Indian like eat more traditional food and like to sew and learn like the cree ways"*

		Part of our culture	*"Generally everyone likes it because they grow with it and you stick to what you know … I think."* *"For me it was always there as far as I can remember there was the geese the bear the moose and the beaver that's what I eat our traditional food it's always been there it's always been a part of our table."* *"Yah it is a huge part of our heritage. Raised with that kind of food raised and taught like the lifestyle."* *"I wouldn't say it's(traditional food) a whole identity but a major part"* *"Why did you use bush food?" " ...change it to eeyou meechum" "... Doesn't matter you can use the words traditional food but eeyou meechum I like that, But in Mistissini it's eenou meechum"*
	Beliefs	Provides nutrients	*"traditional food is high in protein"* *"when I was pregnant … doctor said that my Iron was to low for the baby and they told me that I needed more Iron, they told me that I needed more traditional meat. And that my Iron would go up on it's own and eventually that's what I did."*
		Provides more energy	*"...eating traditional food give you more energy"*
		is healthy	*"It's a lot healthier, traditional food is healthy food"*
		Is a traditional medicine	*"Bear grease has a lot of medicine or components in it. It can lower your cholesterol levels"* *"We need to be more like what my family, my side, my mom always want to eat traditional medicine (inaudible) even with the sugar always notices that when he does eat chicken his sugar rises as when he eats traditional food his more stable. Doesn't go too high and that's how he, she checks her sugar, and she tries to eat less commercial food."* *"there is my uncle that stays in the hospital he always wants to eat traditional food but now we have less time to go there. My mom always tries to take some because she knows that he needs that food to heals"*
		Attain a physical & spiritual balance	*"I am in Montreal and I don't eat it(traditional food) I don't feel myself, I don't feel my own and am out of balance and if I eat it I feel better you know , I don't know if that is like a spiritual thing"*
	Employment	Job provides an access to money	*"We were talking about money and for those who are non-employ, where they get there money? To get there bush food and those who are employed may have the money but they don't have the time"*
	Skills	Introduction of new cooking techniques	*"But, I do a lot of that I use meat like caribou or moose meat in exchange for beef, I don't have to buy beef anymore, so I like it. Maybe it doesn't taste like the way it would taste if I was cooking it by a open fire, obviously." "But usually, I would just take other recipe and I will just use that"* *"But we will probably eventually mix traditional food with vegetables. Yeah! I still notice people they say, : Oh you are going to ruin the taste. I think it is good has it is. When you compare the vegetables without vegetables"*
	Time	Pay an elder to clean and prepare animal	*"I do that with rabbit, I buy rabbit, if I can buy few of them and take them to an elderly women and say: do you want to clean it for me and you can have the other bag for yourself? I go back, she bags them and I put it in the freezer because I don't have the time to clean it."*
	Cost	Cheaper to buy traditional foods from a hunter	*"Yeah, it is cheaper to buy beaver than to go try and get one (laughing)"*
	Convenience	Available in your family	*"Grandparents I guess. My grandparent cooks all the time. When my grandmother is here she always cooks moose stew that was the first time (inaudible) That`s the only time, when my grandmother cooked traditional food"* *"You just go see a family that cooks it or usually like my parents they cook something I like or during Christmas holidays or they always save something"*

SOCIAL NETWORK	Family influence	Encouraged by family	*"Well my family my auntie they cook traditional food like almost every feast which is like every month. We have a feast because like there is lots of us, at everybody birthdays we eat traditional food, my family promotes it to me, like if they cook it then I go eat it"* *"Usually my mom makes traditional foods when I'm at her house - at family gatherings and also for birthdays. Also I have a big family. That's why I help when there's traditional food in there."* *"when I was pregnant that's when I realized they promoted traditional food, when they told me to eat traditional food for my baby to become healthy that's what my aunt, my grandma told me. And doctor said that my Iron was to low for the baby and they told me that I needed more Iron, they told me that I needed more traditional meat. And that my Iron would go up on it's own and eventually that's what I did."*
		Presence of a hunter in the family	*"Well it all depends if the parents are hunters if they have access to it. With the hunters they can bring the food and if you can`t marry a hunter you will have a hard time finding traditional food."*
		Families teach their children traditional knowledge	*"But my parents still teach my kids. Like I said, with certain animals in the spring time. It's traditional."* *"So basically my kids learn, while my father's gone, while my brother... (inaudible), how to clean the caribou and everything. My son learned it from my brothers and father so they pass it on to my children. So, that's how... (inaudible)."*
		Early feeding of traditional foods to babies	*"(during my second pregnancy)I ate more moose meat, more caribou meat, what they gave me even fish but now my baby eats everything. Because I barely did that with my first one he barely does eat traditional food. I will give him a piece of fish and he will just look at it and ask what is that. As for my other baby because I ate it more often he will just go and eat it. He will just eat partridge, rabbit, even bear and. He'll eat it because it is, I ate it. That's why I think it should be more promoted with the pregnant ladies.*
	Elder influence	Encouraged by elders	*"There is also the band office they have traditional program. I used to work there like the secretary. I learned a lot of when I worked with …. And I think also like it influenced me more to be more Indian like eat more traditional food and like to sew and learn like the Cree ways"* *"I told myself to be more into it like what the elders were trying to teach me. I think it had a lot of influence on me"*
	Social norm	Well perceived	*"it's well seen by the community for eating traditional food like by your friends and family"* *"everyone advertises traditional food"* *"Generally everyone likes it because they grow with it and you stick too what you know … I think."*
	Sharing	Shared between friends & family	*"When somebody brings it (traditional food), that's when she eats the Eenou Miichim - traditional food."* *"Generally at goose break or moose break they have lots of meat and lots of geese, or ducks or anything. We pass it all around within our family and friends."* *"So people who don't normally hunt or don't have time you get …or a relative comes by he says you want to have a goose or moose meat."* *"Instead of letting it go to waste you just share it."* "Well I thing there is lot of sharing in the family too, I mean the old days, It used to be the whole community who shared but now it is more the immediate family or friends, you know".
	Extended family gatherings	Family gatherings serve traditional food	*"Usually my mom makes traditional foods when I'm at her house - at family gatherings and also for birthdays. Also I have a big family. That's why I help when there's traditional food in there."* *"Feasts, Well when there is a walking out ceremony there is always a feast with it to or weddings, Special occasions"* *" If that person is at a large gathering, that person will eat what the other people are eating."*

	Values	Never waste traditional food by eating all parts of the animal	*"My kids, you know, my son and my daughter, when they catch fish or when they catch partridge or something, they were told by my parents that they have to eat what you kill."*
		Eating traditional is part of Cree values	*"I wouldn't probably be following my Cree values I guess like I would have stopped eating traditional food."*
COMMUNITY	Residence location	Living in a Cree community	*"Like when I am here (in the community) I am able to have traditional food pretty much every weekend"" Outside the community is a big problem of having access to traditional food"* *"The food that person will eat depends on his or her surroundings. It will depend on the type of country that person is in."*
		Staying in the bush	*"The people who stay out in the bush, they probably eat mostly traditional food".* *"I guess it all depends on the environment we are living in Yah That's like when we are in the bush we intend to practice our traditional ways more than when we live in the community because traditional food is more accessible"*
		Living in an isolated Cree community because : -Less influenced by other culture	*"Well they are more like isolated and we are more closer to like KFC And McDonalds"* *"Yes. I am surprised because they're more isolated. And they have less access to restaurant foods. The towns are more far away than us."*
		- High-cost of non-traditional food	*"I think there food is more expensive."*
	Land access	Having a hunting ground	*"You have to go at your hunting ground. Like for me I have to travel by the Troilus mine, good think they have a road now going there. It is a place where I feel, hah where I fell I can hunt, you know, I have the right to hunt there."*
	Community events & programs	Band Council programs offering free traditional food	*"But there is another thing that ah Elder's point that has fishing program, I think, they have Monday's to Thursday's supper like traditional foods fish or moose meat or what they have and that it's free and a way to be with my mom, I really wanted to eat traditional food and she would say well let's go down there, so we did and we hate fish"*
		Community events offering free traditional food	*"A lot of these community groups I guess whenever there is a community feast we always include traditional food"* *"That is something that happens to me. I will go and eat it at a feast but I don't cook it everyday"*
		Fundraising	*"Also like in groups some people will have fundraising they will advertise like goose over the fire you know."* *"The other thing I've noticed is that people sell plates - traditional plates. That's how my mom gets some and that's how I get some too."*
	School & childcare programs	Served in child care centres	*"Hey I think the daycare serves traditional food do they. I remember when I when to the daycare they had stew"*
		Cree cultural programs in schools	*"I find it that the school are promoting sort of traditional food but really I am not certain of that. Well I know they have the Annie Whiskeychan Day but it's once a year"*
	Cree Trappers' Association	Sells traditional food	*"Cree trappers sell like rabbit or beaver so I guess that's when you are desperate you don't have to go far"* *"They used to sell rabbit, long time ago Yeah Even the CTA they sell beaver."*
		Funds program	*"...the Cree Trappers Association provide these expenses. To help people that are on low income but they still have services for those people that are working but you have to be a member of the CTA in order to receive these types of services and it does, all Cree communities have that"*
	Local businesses	Sometimes available at the grocery store	*"I know in Chisasibi at the Coop they sell Caribou meat sometimes when it is available. They sell fish"*

ENVIRONMENT	Laws & regulations	Traditional foods can be exchanged	*"But we have under the James Bay Agreement we have a right to exchange"*
	Wildlife sustainability	Traditional regeneration techniques practiced	*"I think that now a days I've noticed that my family only go hunting in the fall and in the spring and sometimes in the winter but not all the time. I think that's the whole point of it where you can let it grow or (inaudible) they say that we should not kill the female in the spring because she is carrying the baby moose to promote life as in the spring the female carries the calf."* *"Like, even when you hunt, he didn't kill all. Like, let's say there was a beaver there - a beaver dam. He didn't kill all the beaver there. So, he would take his trap out and let the beaver reproduce itself - take care of the land. That's what he used to do. Even my mom to this day, this last goose break - my kids were really trying to get some partridge. My mom said 'Don't touch them because they are having their babies.' So, that's what the kids were taught. Even rabbit, there's a certain time when you don't go snaring it. Let them have their young."* *"Because I know that what my brother it is what he does when he goes hunting he kills the male like sometimes he will kill the one where it is like a luxary a female moose like something we need to be really proud of. Because there is not that many on their land and on my other side of ... that's what they do they let the mother go so she can go and have her babies but if they find... I know that my brothers find it really hard not to kill them the moose ... very so that's why they, I don't know but I find them respectful when they do that. Because they know it is very hard not to kill it and ..."*
	contaminants	Not listening to public health messages	*"Myself I don't usually listen to that, you know, If I get a lake trout, I'll eat it (laughing). I won't pay any attention you know. I won't follow to have it once a week or once a month the way they recommend we do, you know (laughing)."* *"But if you look at the meat you can tell if it's good to eat or which one is not so you can keep it to eat. Even people that don't worry about that know that. Like you don't go and eat meat that looks that it has been there for like 5 years you know but so it is all common sense I guess So you think that people that eat traditional food any way they know how to recognize contaminants or they know how to choose? Yeah"*

Table V Citations associées à chaque obstacle identifié

Blockers			
		Sub-Factors	**Examples**
INDIVIDUAL	**Lifestyle**	Not practicing traditional activities (i.e.: snowshoeing, carving, hide tanning and sewing)	*"...It could be another reason (for not eating traditional food) also like she doesn't go for goose break or doesn't go in the bush ..."*
	Preferences	Dislike the strong tastes of some traditional foods	*"And beaver I will never eat beaver because it has this strong taste."*
		Dislike the altered taste of wild game	*"So they (wild animals) taste different and they eat what ever they can find I guess. It is what people are saying, it taste different now, when before they were, I guess better.*
		Dislike of new cooking techniques	*"Well, there is lots of people experimenting different style of cooking but I found that it doesn't taste the same (laughing). You know wild, wild bush food it is about is flavour."*
	Beliefs	Being cursed for your hunting	*"I don't know if this is helpful but they used to say in the old days - I remember my parents used to talk about these things. People used to... I don't know how you say it in English but the curse (midewin - shamanism). That part. Because of what this other person did, those were the beliefs. So, people would not kill. So, people could curse another person not kill any animals."*
	Employment	Lack of time with a job	*"They (people) no longer go to the bush. Even their children, they don't go into the bush. They work year-round. The only time they go is for the goose break."*
	Educational attainment	Having studied outside the communities may lead to a loss of Cree value	*"They probably live the lifestyle of White people. They have more education so they don't care about the traditional Cree food."* *"Going out to school let's say you are a parent you bring out your little family like you know you really don't get the chance except when you go home it's not as often"*
	Skills	Loss of traditional cooking techniques	*"That is something that happens to me. I will go and eat it at a feast but I don't cook it everyday or I don't know why. I would if I knew how to cook it I guess."* *"I have access to goose but I don't cook it because it is only in the oven that I can cook it or boil, but a goose over the fire is a delicacy."* *"And now they don't do that they just put it in the freezer. All of those preparations and cooking method are going out the window."*
		Loss of preparation techniques	*"The other thing too is preparation, how you prepare. Like for my family sometimes is really hard for us to try to cook a feast the right way, you know what I mean? You have to know, how to cut it up, how to cook it, you know what I mean? Sometimes, it is really difficult. (It true, what your saying) You need to know how to prepare it, to clean it and then how to keep it in the freezer until your grand-mother comes along (Yeah) or mom (laughing, yeah) Your mom knows how to, you know what I mean? Yeah that is where. I think it is the reason why some of the young people don't eat that much traditional food because they don't know how to prepare it."* *"When you take all your fish, let's say you catch 50 fishes, you bag them and put it in the freezer. Long time ago, you'll had to smoke them (yeah) If you wanted to preserve them, so that's how you start to loose that traditional way of preparing food and it is easier know to just bag it and put it in the freezer (yeah)"*
		Reluctance to exert effort for preparing and cooking	*"Yah I know how to do it but I just don't do it because it is to hot in there."* *"I think people umm are lazy cooking traditional food not like when you get something from the store you just open it and put it in the microwave very easy and convenient but to cook traditional food you have to cut it up boil it or you put it in the oven"*

	Time	Long preparation time	*"It does take time to prepare it"* *"So that's what we ask people because they are too lazy or they don't have the time I should say to prepare the food"*
		Lack of time to go hunting	*"You need the availability to go up there or else leave in the bush all year."* *"Okay but so If I go to Troilus (his camp) that mean I would have to ... take an holiday ..."*
	Convenient	Not convenient	*"I think people umm are lazy cooking traditional food not like when you get something from the store you just open it and put it in the microwave very easy and convenient but to cook traditional food you have to cut it up boil it or you put it in the oven"* *"Does not come in a can It is not prepare, you know"* *"Then again it is lot of work preparing it"* *"Here in the community they use there money to buy there chicken and there pizzas and poutine and any other thing else because it is cheaper and available"*
		Not always available	*"it is not always available maybe once in a month or something so when it is there I like to eat it the goose and share it with someone"* *"the person will eat - what is available."* *"I notice my family, this past goose break they killed, in all of our camp maybe we can count 15 hunters that go to the blinds and they only killed like 20 geese but they all have to share the geese and we already ate some, so people only got like one goose to take home after goose break every year (inaudible). Same with the moose in the fall like ... we have 15 hunters and 2 of them are lucky or maybe 1 is lucky to kill one or two, so they will all cut it and separate the meat for all the family to get like that's (inaudible). I don't know if it's like that with the caribou in the winter there were barely that came all the way down, they were so far or up north"*
	Cost	Traditional food is expensive	*"It cost money to get traditional food now because the people don't live in the bush. When they used to leave in the bush, They used their money to get tune and they survived on the food that they got and now it is. Here in the community they use their money to buy their chicken and their pizzas and poutine and any other thing else because it is cheaper and available."* *"Even at the Cree trappers association, they sell... for some people don't have... especially the elderly people, they don't have the money to buy beaver or rabbits. The Cree trappers sell rabbit, beaver and some people buy them but those that don't have any, they don't have any money to buy it. So, money is a big part."* *"It's really hard to share because it is so expensive to live today with the way we are living. So that's what a lot of people will do sell their goods"*
		Hunting is expensive	*"Sometime when you want to go to the bush you got to pay for the plane or like the gas it costs a lot of money"* *"It costs money to go hunting even ... they know it costs money because they still have to pay for gas and if they go out hunting they still have to go on their own land, territory it costs money to go there sometimes it's far"* *"Our 3 partridge and a rabbit probably cost us 60 $. Not counting the shell, just the gaz. So it that way, it is expensive too."* *"You need the money to hunt ... traditional food"*

SOCIAL NETWORK	Youth influence	Children won't eat it	*"Okay, and know he's got 3 young families with them and this those young families they don't want to eat traditional food, you know . So, 2 weeks ago, my aunt came out by plane and spent few hundreds dollar just to come out, buy more groceries for those young people that they are living with and she bought boxes of boxes of junk food. I saw chips, I saw cookies and it was all the kids that was buying, you know."*
		Not eaten between friends	*"My friends they don't they don't even talk about traditional food or like let's have some beaver where as my family would call me and say hey come on over we cooked some partridge"* *"how it is like in the family, that's how that person eats, How the friends eat, that is how that person eats ."* *"Yah friends are blocking it and family promoting it, it's what I mean."*
	Family influence	Absence of a hunter in the family	*"She is asking what's blocking like I don't have a man yup I don't have a man to hunt for me"* *"Well if your grandparents are sick and we can't go out hunting that's a big factor"*
	Social norm	Live in a fast food generation	*" We live in a fast food generation and traditional food is in the slow food generation."*
	Family incomes	Family hunting is expensive	*"The family have to have money to be able to access it"* *"What I heard if there is a family of 5 or more, you have to have at least 5 thousands dollars or more to spend on all equipments that you need for hunting, fishing and trapping. And it's expensive because of the way we live today, the things we are eating, the things that we are traveling with and we need a lot of gas money"* *"Even our elders there isn't enough money sometimes to go into the bush, they have to work"*
	Values	Wasting of traditional food	"That is not the same, the idea on the community level, we need to get idea in of the importance of animal. Now it is not, they don't seems to mean anything. They just shoot them and if they go to far, they don't worry about them. This fall, you will probably see lots of, especially in March, you'll see all kind of geese and ducks and fishes and stuff like that on the dump. (Inaudible) moose meat and then again in may, you'll see all big chucks of moose meat and caribou meat on the dump, to fell up your freezer with geese. Last year, my son found 100 something geese old geese on the dump." "Lot of people waste food here. You should go to a feast here and you will see a whole leg going to the garbage after a feast."
		Less respect for animals	"The Cree values of respecting animal is not being past on, you know. From the elder's to the youth, I think it has a lot to do, well it is respecting the animals, plus the environment, you know." "Well, Not only the white people that are less respecting the younger generation that are not thought to respect" "...many people come by and killed the bears on their (my grand-parents) land"
		Eating traditional food not as important as before	"So, I think a lot of it is that the family doesn't insist that the children eat, it is changing values. (Hum-hum) They don't want the kids to be mad at them and all this other stuff" "They probably live the lifestyle of White people." "I'm sure there's people like that here in Mistissini too - that don't care about the traditional Cree food. This is what is probably happening."

		Reluctance to exert effort to get traditional food	"So those day, you will see a caribou, aaah it is going to be to much work to pull out, go back to the road and look for some more (yeah) (laughing). Before it was, Oooh Caribou tracks okay let's go, we are chasing those for the next days until we catch up with them and get one. But now days, it is aaaah he is not on the side of the road so I won't shoot them will go look for another one (lauging)"
	Knowledge	Lost of traditional knowledge	*"There is no knowledge past with that generation of elders, they get that this H1N1 and die the next month and we'll lose all our cooking expertise in that age bracket so lot of it needs to be having show the people how. It is like the old Chinese proverb that say : Give a man a fish, he will eat today, teach him to fish and he will eat forever."* *"I think the biggest at the community level is to figure how to pass the knowledge Yeah, Yeah Both of hunting and cooking and for preserving but because it is … on the individual level with the family it is not really… not every family are included, and if your family doesn't hunt or father and mother past away in an early age your kind of left in limbo to look after yourself."* *"I think it is part of the knowledge that should be past down, even if people don't do that, you know, at least we would know how our parents , our grand-parents used to hunt, what kind of ritual when on, you know. Like my brother and I, went we hunt, we still try to do what our father told us, we kill moose or a bear we will hang the skull on a tree, offer some tobacco*
		Loss of animals anatomy knowledge	*"I am not able…they don't label it. I don't know which is the good part so I don't. I wait for them when they come back then they cook"*
COMMUNITY	**Residence location**	Living in a city	*"If that person is in the land of the Whiteman, he or she will eat Whiteman's food. The food you eat depends on where you are."*
	Land access	Not knowing any tallyman	*"There is about sixty tallymen in Mistissini and a lot of them are from big families so a lot of the families are not related to the umm the tallymen because they didn't have any land themselves so that is where it stops for someone who wants to do traditional pursuits"*
		Hunting ground is not easily accessible	*"You know my uncle Tommy, I thing he told me it cost 70 00$ to go by plane to his bush camp. Even do, he can go out with James Bay road, go out to camp Rupert and it is only 5 km to his camp from there. He could walk there, you know. But there is no road so he doesn't see the reason why he would walk or Why do that way, when you can fly? So it takes him an hour, or less than a hour to go to his camp, it takes a long day to drive around and plus another few hours just to walk to his camp.""*
		Hunting on other territories is frowned upon	*"But you can't just go hunting anywhere like let's say just past perch river I don't know who's territory it is because it is like stealing you know"* *"In the bush to go hunting. Because we can't hunt here. We can't just go out and kill a moose that I would see out on the road here. I don't know… Who's land is this where we are close by ? You have to ask them if you want to kill a bear or because we all have our own land where we can hunt."*
	Community events & programs	Providing food instead of showing how to prepare it	*"But the other thing too is those kind of program really help when they talk people how to prepare but you have a group of people who prepare and feed other people, which is good because other people get to eat traditional food that they may actually not have but then there is no knowledge past with that generation of elders, they get that this H1N1 and die the next month and we lose all our cooking expertise in that age bracket so lot of it needs to be having show the people how. It is like the old Chinese proverb that say : Give a man a fish, he will it today, teach him to fish and he will eat forever."*
		Expensive to buy traditional plate from fundraising	*"Yeah, people sell plates. They have very small portions and the plates cost $15 each. I had bought a plate and it wasn't enough. I had to get two plates. It was such a small portion. The portion was for a child."*
	School & Childcare programs	Cree cultural programs in schools are limited in scope	*" it suppose to be there at the school in the cree culture but they don't do much they will make paddle that this big (showing a paddle the size of an hand) and not good for anything (hum-hum) And the axe handle are like this instead of the real axe handle. So that knowledge from knowing how to do it form long time ago, to be past on now is very fastly disappearing. I don't think my son can make a paddle either but. My father in law used to be very good at it."*

	CTA	Not everyone can afford for traditional food sold by CTA	*"Even at the Cree trappers association, they sell... for some people don't have... especially the elderly people, they don't have the money to buy beaver or rabbits. The Cree trappers sell rabbit, beaver and some people buy them but those that don't have any, they don't have any money to buy it. So, money is a big part."*
	Local Businesses	Not available in restaurants and grocery stores	*"It would be really cool if they did it and if they sold it like at the restaurant instead of ordering like poutine"* *"And the other thing is, the restaurants don't serve traditional food. None of the restaurants serve it."* *"I wish that the stores here sold traditional food. (laughter) We should be getting it from the store. What I said was, they should sell traditional food at the store."* *"Well if we look at each entity I guess grocery stores and restaurants are not allowed to promote traditional food and it's against the law in some way"*
		Absence of businesses to clean and prepare traditional food	*"Maybe if they have a place where we can bring ducks and goose and they prepare it and cut it out like smoke it and they give it back to you so you can preserve it , eating it with your family. You mean like… Like a organization or a group of persons in the community prepare all the traditional food, for those who does know how to prepare it they can take it over there and prepare it for you and give it back to you so you can feed your family. Even if you catch a lot of fish there, like for me I don't know how to smoke it, I can bring it to them and they prepare it for me and they give it back and I can eat with my family."*
ENVIRONMENT	**Laws & regulations**	Hunting limited to land categories 1 & 2	*"We are on category land 1 and 2 outside of it we can't hunt"*
		Traditional foods cannot be sold	*"Well if we look at each entity I guess grocery stores and restaurants are not allowed to promote traditional food and it's against the law in some way Is it like, you cannot serve any traditional food Like at the store"*
		Governmental entities are not allowed to serve traditional foods	*"As like regional organization or local organizations they want to serve traditional food but we are so being blocked by provincial legislative laws and the Cree Health Board and Grand Council are trying to change these laws and as Cree Health Board we are working for providing the traditional food to help the health Board settings like the reception center and the hospital did we have all these stuff like distributing of traditional food for patients in Chisasibi. We will all eventually provide traditional food to all their settings like the elders, the elders home and we know that there are a lot that states that we cannot provide that traditional food cannot be sold at grocery stores and being a self government body as the Grand Council as we are all under the Grand Council."*
		Government laws are confusing and not adapted to Cree realities	*"self government body as the Grand Council as we are all under the Grand Council. They are working in developing laws that apply to our traditional ways and slowly we will eventually sort of adopt to provincial and federal laws because what we are doing now we are providing traditional food but we don't know who is providing traditional food and I think we will eventually become, we will eventually have to know who is providing traditional food because each community is growing at an alarming rate that we don't know. Like there is so many people that are over 18 today and they have their own vehicles. There I don't know if they would be like poaching in other peoples territory and the way that the federal and provincial laws we don't really apply these laws to our people and eventually we will have to, provide this kind of."*
		Cree lands are open to other hunters	*"Like you know that white people are allowed to hunt on our lands, there are certain time of the year and come and kill a lot of our moose, it makes me kind of sad because there is barely moose… because they should keep it you know for our hunters, like all the man in our family they could kill it in the fall because already these hunter kills so many all already now there is barely any moose left. But our hunters hardly get it maybe only one moose or two at the most in the fall now. Where before in the fall all the males would get one each but or two every fall. And all of the meat will go, like everyone gets a piece. (Inaudible)"*

	Wildlife sustainability	Land modifications endanger wildlife	*"In Whapmagoostuii they are starting to see moose over there. And it's rare to see moose over there They are going the moose are going up Because the weather is getting hotter? No, it is the land is getting clear cut there is nowhere for them to harvest so they go north"* *"Like in Chisasibi, like my husband where they hunt in Chisasibi is like the coast the James bay coast that's where their land is and there is hardly any geese their not like before where they used to be they used to kill so much now there is hardly any and now they got 2 this year but it was only a week. Because they go land or never land or they go further I think because there is nowhere to feed or whatever I don't know what you call those plants that are near the ... they say because they are"*
		Wildlife population is not monitored	*"We don't know how many caribous are left we don't know how many moose are left, we don't know how many beavers are left, like who is like who is managing the wildlife and they are the CTA is managing but there ... they have started to find out exactly what percentage we have left of traditional food in our territory. And it's so difficult today to know exactly, exactly because there is so much activities that's happening,"*
		Traditional regeneration techniques not practiced everywhere	*"some of the offspring like they cannot be shot at or kill because of... so that they regenerate itself but if we don't teach these type of traditional laws to our people we will slowly be getting rid of the traditional food at an alarming rate"* *"And the way we are preserving, the way we are taking care of our land we need to be more educated in it."* *"I hear when you are out hunting beaver, and you only kill one or 2 out of the lodge. But now I hear that people are killing all the beaver in one lodge, so of course next year it will be none there. For the preservation., you know, when people goes goose hunting, I hear people killing 100 geese, you know. Now, who's gonna eat 100 geese (laughing).*
		Switch in hunting patterns	*"For caribou, my father in law, will always tell me to shoot the small home, shoot the smallest one. And now they are trying to shoot the biggest one, even if the biggest one (inaudible) They kill the strongest on the genes for the big ones."*
		Growing Cree population	*"I thing the biggest thing in the environment is the space to use what we have, because there is 15 000 Crees and I think in the environment we wouldn't have enough. If we all go back to eat traditional food we would starve to death, at least we would be skinny (laughing). I don't thing there is enough"*
		Unlimited killing	*"the other think to is the amount of harvested it is something , that need to be fix in the environment when you heard stories of 2 guys going out and killing ten moose on the week-end. Yes, it is good for the community for people to have some food but it doesn't really help the environment at the most because the one they kill in march are the pregnant female so they are killing 2 or 3 at the same times, instead of one. ...So there is that aspect of the regional and the environment must be work on."*
	Environmental impact projects	Roads	*The other one is what I mention before with the forestry and mining, especially the road are being put in now, they put road now where it goes to mountain, that is gonna open all this area where who ever wants to go to hunt, go to hunt. If your native or non-native. This thing open-up,... change the ecosystem with that, changes the balance."*
		Flooded land	*"Especially with some lands being flooded too new hydro dams being built and all the inland animals could become scarce in this area you know"*
		Production of noises	*"Only the cabins that are scattered across the Cree nation land there and if they here noise they just go anywhere they are unpredictable as where; as before we knew where the geese were but as there is so many like line cutting and there's mining here; there's a camp here"*

		Clear cutting	*"Get ride off the forestry The forestry what do you mean? Well, forestry is between here and Chibougamau there is 50 trees? All you see on the side of the road it is all it is there, now if you go up this way, in the summer, they clean up what they didn't touch. So that's make a big impact on, especially on the small game partridge and rabbit. Even over here, na? Yeah, in Nemaska on the route du nord there so many road off they cutting those little mountain before the Rupert river, such as the brokeback. The forest is growing, it is going to come back yeah but in the mean time it is going."* *"The other thing too is probably the forestry, that is happening around. Because I hear some people say that when they eat rabbit, it taste different because the food the they eat or the tree they eat is not longer growing in certain area. So they taste different and they eat what ever they can find I guess. It is what people are saying, it taste different now, we before they were, I guess better."*
	Contaminants	Mercury fish levels	*"I think the Cree Health Board did a survey about fish that was the time when mercury used to be high and the peoples consumption in fish went really low"* *"Maybe because of the - fish sickness. Oh. Mercury? Mercury. That's why I stopped eating fish. OK. Because of the mercury level."*
		Other contaminants	*"I think there is lot of stories about contaminants, contaminations, public health, they always telling us : don't eat fish they got mercury, or if you see something wrong with the liver of the moose, now, you need to send it to (inaudible), That's what is discouraging people from eating traditional food. "*
	Regional entities	No leadership over land preservation	*"like we have the mines, the dams, we have the forest fire and we really need to take care of the land where we once did and we need to do it, we need to practice it our traditional ways on how to, for the stewardship of the land. We need to take more presidency to it, but a, there is a traditional law on how we should be on like in their territories the trapper will only allow people to go there and sometimes there would be left for twenty years because to allow the traditional food to grow by itself to farm itself."*
		Absence of a task force promoting traditional food	*"I think it would be essential to have a to have some kind of working group on traditional food, because we sort of need a lot of educational part to the community and the family. I don't know exactly how the should prepare traditional because we don't know how to prepare traditional food. The reason we are today is because how we learned on what is good for us. Like having the expertise helping us cook out traditional food and it has been developed and there has been some nutritionists that help the CHR's or members to help on how to how to cook traditional food but I am not sure if these cooking classes have ever included traditional food that are certified*
		Could be better promoted by regional entities	*"I've noticed that a lot of the regional entities not, like the Cree School Board do not promote, provide traditional food and the Crees …The Cree Health Board does but not as much as it should, I think we really need to regulate like adopting the laws of the federal and provincial to our own."*
		Stakeholders don't lead by examples	*"It's kind of … to me it's kind of a block. I don't really see them as eating traditional food when they go out on their big meetings or say we ordered beaver you know when they go out there all they do is Restaurants that is There 5 star meals, I think they are kind of negative after the community the regional …. They always held their meetings and have them down south Even what they do when they come down is go and eat at the lodge 3 times a day then there is the feast at the end of the week that's all, During the meetings So same for the grand chief he probably eats traditional food but I don't really see them, It's like he is a promoter I guess. Like if they give example more people would eat it. I think they should promote it."*
	Cree Media	Not promoted on the radio	*"The regional radio station … Mamuitaau It is on now They use to promote it eh for like cooking but when you listen to the radio you barely hear about anything traditional, all they talk about is hockey and but they do talk cree you know. I think it's kind of a block to me"* *"But I find that the Cree media is not visibly but they still do provide and we were saying that traditional food is not being promoted as much as it should"*

V. Annexe V - Plan de diffusion

Communications Plan

For Factors associated to traditional food consumption

Prepared by: Véronique Laberge Gaudin

Communications Requirements

1. Stakeholders

For this project, stakeholder groups include:

- Residents of community
- Residents of community who will be part of study
- Band Council
- Cree Health Board professionals
- Scientific community

2. Communications Plan

2.1 Schedule

ID	Event	Description	Purpose	Method	Freq/Date	Responsible	Tasks	
1.1	Nutritionist meeting	Meeting the CHB nutritionists	To announce the results of the study to the nutritionists community in a transparent manner and to ensure two-way communications process	By phone	Once	Head of research team	Prepare power point presentation	Done February 2012
1.2	Environmental health study Scientific gathering meeting	Scientific meeting to discuss the results of the study	To announce the results of the study to the scientific community in a transparent manner and to ensure two-way communications process	In person	Once	Head of research team	Prepare power point presentation	Done March 2012
1.3	Band Council meeting	Meeting with Band Council	To announce the results of the study to the band council in a transparent manner and to ensure two-way communications process And to obtain there approval for publishing scientific articles	Print	Once	Public Health department	Prepare 2 scientific article summary	Planned September 2013
1.4	Community radio interview and plain language article	Interview on local radio with phone-in	To talk about the results of the study in a transparent manner and to ensure two-way communications process	Radio	Once	Head of research team	Prepare a briefing sheet for radio message	Plain language article published august 2012
1.5	Public Health meeting	Meeting the CHB public health department	To announce the results of the study to the scientific community in a transparent manner and to ensure two-way communications process	In person	Once	Head of research team	Prepare power point presentation	
1.6	Scientific Poster	Publish poster for scientific	To announce the project and raise	Print	Once	Head of research	Design, print,	Done, November

		gathering	awareness about the results of the study			team		2012
1.7	Study results to study participants	Release study results back to local residents who were part of study	To announce the results of the study to the study participants in a transparent manner and to ensure two-way communications process	Print	Once	Public Health department	Send a copy of both scientific article summary to participants	After acceptation of master thesis

2.2 Assumptions

It is assumed that

- There is a need to link health research to practice in the Region in a relevant, respectful and meaningful way;
- Knowledge transfer is not restricted to the transfer of Western scientific knowledge to the Cree Nation, but includes the transfer of western AND indigenous knowledge;
- The development of strategies to foster knowledge transfer is not restricted to the 'authors' of the knowledge, but requires the input of all stakeholders;
- Knowledge transfer is not exclusively unidirectional (only from researcher to community or only from the community to the researchers). The transfer of knowledge is a bidirectional process.

2.3 Risks

- Low level of community awareness about the aims and nature of the study
- The announcement of the study will not be communicated in a relevant and meaningful way to the population
- Lack of awareness by key members of the community
- Context within the community colored by years of negative experience with research and researchers from external agencies

VI. Annexe VI - Curriculum Vitae

PROFIL
Diététiste/nutritionniste bilingue
Expérience en santé publique et en nutrition communautaire
Leadership, capacité d'adaptation & compétence en milieu interculturel

ACCRÉDITATION
Membre de l'ordre des diététistes du Québec (OPDQ)

ÉDUCATION

Dépôt prévu Juin 2013 — **Maîtrise en santé communautaire, option mémoire**
Facteurs associés à l'alimentation traditionnelle au sein de trois communautés cries du Nord du Québec. Devis mixte combinant régression logistique et groupes focus utilisant une perspective écologique
Dirigé par Louise Potvin et co-dirigé par Olivier Receveur
Université de Montréal, Montréal

2004 — **Programme court en anglais,** TELUQ

2002 — **Baccalauréat en nutrition,** Université Laval, Québec

EXPÉRIENCE PROFESSIONNELLE

2005- … mars- — **Agente de programmation, de planification et de recherche,**
Direction de santé publique, CCSSSBJ
Planification, organisation, implantation & évaluation programmes en nutrition
Supervision de stages, recrutement, orientation
Répondante régionale en nutrition et en allaitement
Gestion budgets fédéraux « PCNP » et « IDA »

2008- 2010 mai – sept — **Coordonatrice par intérim**
Direction de santé publique, Conseil cri de la santé et services sociaux de la Baie James (CCSSSBJ)
Support à la gestion des équipes de travail : habitudes de vie, maladies chroniques, santé au travail et environnement;
Répondante régionale à la TCNPP;
Planification services intégrés équipe Chishaayiiyuu (maladies chroniques).

2002-2005 mars-mars — **Diététiste / Nutritionniste**
Programmes soutien à domicile, diabète & prénatal
Mistissini, Nemaska, Waswanipi & Ouje-Bougoumou, CCSSSBJ

PRÉSENTATION, PUBLICATION

Andermann, A. et al, (2007) *Health Promotion In Iiyiyiu Aschii: Reflections on a workshop exploring the opportunities and challenges of using the Ottawa Charter for diabetes prevention in the Cree Nation of James Bay Northern Quebec*, Reviews of Health Promotion and Education Online.

2006- Oct Atelier 19: *The Ottawa Charter in the 9 Cree Communities of Iiyiyuu Aschii (James Bay region): a diabetes prevention program at work.*
10iemes journées annuelles de santé publique, Institut national de santé publique (INSPQ)

2007- Juin Atelier: *Challenge and Opportunities for Diabetes Prevention and Health Promotion in the Cree Communities of Iiyiyiu Aschii (James Bay Region of Northern Quebec)*
19eme conférence mondiale de l'UIPES

BOURSE, RÉCOMPENSE

2001 **Bourse Profil international**
Université Laval
2008 **Bourse d'excellence académique**
Département de Médecine Sociale et Préventive, Université de Montréal
2012 **Bourse d'excellence – rédaction**
Département de Médecine Sociale et Préventive, Université de Montréal

EXPÉRIENCE DE STAGE

2000-2001 **Diététiste / Nutritionniste** stagiaire
Nov-Août CRESP, EcoYoff, ONG, Sénégal, Afrique de l'Ouest
Combating Anemia in Children and Reducing Chronic Disease Risk in Adults combinant Preceed-Proceed, « planifier avec le dialogue » & déviance positive; En collaboration avec l'Université Laval (Québec), Tufts University (Boston, US), & Université Chaeikh Anta Diop (Dakar, Sénégal).

IMPLICATIONS ÉTUDIANTES

1999-2000 **Présidente**
Association étudiante en nutrition, Université Laval
1998-1999 **Vice-présidente affaires extérieures**
Association étudiante en nutrition, Université Laval