

Traditional Indigenous foodways and retail subsidies: Evidence from the Northwest Territories Community Survey and Nutrition North Canada

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April 30, 2024

Abstract

Traditional foods (often referred to as “country foods”) play a critical role in Indigenous culture, nutrition, food sovereignty and food security. Policies that prioritize store-bought food are often viewed as undermining these foods. We provide evidence that two recent policy reforms that subsidize store-bought food in the Northwest Territories do not appear to negatively impact traditional foods. Our analysis uses community surveys conducted in the Northwest Territories that measure the importance of consumption and production of traditional country food along several margins. Using a difference-in-difference methodology, we show that two transitions associated with the Nutrition North Canada subsidy program – the transition from Food Mail to Nutrition North in 2011-2012 and the expansion of subsidy eligibility to new communities in 2016 – had a zero or positive impact on these outcomes. We use price and quantity data from multiple sources to provide evidence on mechanisms and find support for an interpretation based on country foods having a high income elasticity and low substitutability with store-bought meat and other foods.

JEL classification: C54, H31, H53, H71, O10

*Nicholas received support from a SSHRC Explore, SSHRC Insight Development Grant, and a Nutrition North Food Security Research Grant. Thanks to the editor, two anonymous referees, Sara Enns, Randy Jenkins and participants at the 2024 ACEA conference for valuable comments. Special thanks to the Economic Statistician of the Northwest Territories, Jeff Barichello, for his time and effort in putting together some new tabulations for our analysis and explaining the data collection methodology. All errors are our own.

1. Introduction

The production (through hunting, fishing, trapping, and gathering) and consumption of traditional foods (often referred to as “country food” in the literature) occupies a central place in Indigenous culture and communities (Gombay, 2010; Kumar et al., 2019). As the basis of the historical Indigenous economy, these foods have a special cultural importance and are prioritized in treaties and land claim agreements negotiated between Indigenous peoples and European settler-states (Freeman, 1976; Brice-Bennett et al., 1977). They also play a quantitatively important role in the diets of Indigenous peoples against a backdrop of low income, high retail food prices, dietary inadequacy, and high food insecurity (Tarasuk et al., 2018; Leblanc-Laurendeau, 2020). Warltier et al. (2021) estimate that a majority of Nunavut communities satisfy their protein requirements through locally harvested food. Across the 34 communities in the Northwest Territories we consider in this paper, the average share of households that report consuming most (over 75%) of their meat and fish from hunting/fishing is over 40%. Due to their cultural significance and nutritional importance, as well as their role in fostering food sovereignty and local employment, Indigenous communities and leadership frequently center traditional food production and consumption in their food security strategies and policy consultations (Council-Alaska, 2021; Canada, 2016; Kanatami, 2021).

While traditional foods remain culturally and nutritionally important, their consumption has declined steadily as a result of centuries of trade and government policy. Early trade with Europeans often supported traditional food production, with guns, bullets and steel traps being among the most popular items exchanged for furs. As settler colonialism encroached on more Indigenous lands, Burnett and Hay (2023) describe how food policy became a tool of assimilation, documenting a long history of hunting restrictions, government propaganda, and coercive policy designed to promote European diets and reduce the importance of traditional foods. In its place was store-bought food, which was increasingly purchased with government benefits due to declining income from the fur trade. Family Allowances (cash transfers) were provided conditional on settlement, which increased population density and lowered the accessibility of traditional foods. Forced purchasing lists – which prevented many Indigenous people from using Family Allowances on hunting supplies and instead forced them to purchase specific foods from local retailers – constituted both a form of corporate welfare (supporting retailers that were experiencing declining

profits from the fur trade) and a mechanism for assimilation into the Canadian nation state. Policies perceived as prioritizing store-bought food over traditional foods continued through the Food Mail program, which subsidized air freight of specific products (including meat) to remote communities lacking year-round surface transport by sea and land, and its successor, Nutrition North Canada, which pays a freight subsidy directly to retailers for eligible food products. The transition from Food Mail to Nutrition North has been explicitly criticized on the basis that hunting supplies were subsidized under Food Mail but not under Nutrition North (Stephenson and Wenzel, 2017; St-Germain et al., 2019; Burnett and Hay, 2023; Daley et al., 2024b).

In this paper, we quantitatively assess whether two recent policy changes in Canada's North have undermined the consumption and production of traditional foods. We use data on consumption and production of traditional foods for the 34 communities in the Northwest Territories between 1998 and 2018, together with price data from multiple sources and data on quantities and subsidies collected by the Nutrition North Canada program. Across communities, we find that consumption of traditional foods is positively correlated with Indigenous and remoteness, but has a more ambiguous relationship with market income. We use a difference-in-difference framework to analyze two major policy changes that occurred during our sample period – the transition from Food Mail to Nutrition North subsidies that affected 10 communities from 2011-2012, and the transition to full Nutrition North subsidy eligibility in 2016 that affected 4 previously ineligible communities.

Somewhat surprisingly, given concerns that retail subsidies undermine the consumption and production of traditional foods, we find that both policy changes had the opposite effect, increasing production and consumption. We examine mechanisms behind this effect, establishing that both reforms reduced retail prices for two baskets of store food that include a substantial share of meat. Using data on the quantity of subsidized food shipped to affected communities, we show that store-bought meat makes up only a small share (16%) of the value and weight of subsidized foods and the price elasticity of store-bought food – and especially meat – appears to be low in response to the 2016 increase in subsidies. As the value of these subsidies is substantial (equivalent to 2.5% of median income for the average household in the 2016 transition communities), an economic explanation for our findings is that the income effect of store subsidies outweighs the substitution effect. That is, evidence suggests that both transitions reduced the price of store food, resulting in savings for

households that then chose to consume more traditional meat sources due to their higher income elasticity. Although the small sample size leads to fairly imprecise estimates, the estimated magnitudes appear to be larger for the 2016 policy change than the 2011-2012 reform, consistent with a greater reduction in prices and larger income effect resulting from a pure subsidy increase instead of a broader set of reforms that may have increased prices for some goods and communities.

Thus while traditional food collection is undoubtedly a form of subsistence production and a coping strategy for dealing with high food costs and limited job opportunities, our results suggest that there is a high unmet demand for these foods that is not eroded by retail subsidies. This contrasts with the Indian setting analyzed by Li (2023), who shows that government food security programs can reduce subsistence production when they take the form of in-kind benefits. A key difference is that subsidized and home-produced staple grains are close substitutes in India, while traditional foods are not widely commercialized in Indigenous communities and appear to have low substitutability with store food and store meat. Li (2023) also finds that when own-production is the most efficient way for households to procure food at the margin and own-produced food is a normal good, food security policies that act like income transfers can increase own-production of staples for consumption, which is consistent with the mechanism identified here and suggests that unearned income transfers might have even larger effects on production and consumption of traditional foods.

To our knowledge, this is the first study to quantitatively assess the determinants of traditional Indigenous food consumption and production in Canada across a large set of communities, and to specifically assess how they are affected by subsidies like Nutrition North that support consumption of store-bought food. Several recent studies have undertaken quantitative analysis of the Food Mail to Nutrition North transition (St-Germain et al., 2019; Daley et al., 2024b), showing that it was associated with increased food insecurity in Canada's North. We contribute to an understanding of this transition by providing the first quasi-experimental evidence that, despite the findings on food insecurity, this transition lowered prices for a broad basket of foods. Other studies have shown that Nutrition North subsidy increases (including the 2016 transition we study here) resulted in incomplete pass-through (67 cents per dollar of subsidy increase on average) due in part to monopoly power (Galloway and Li, 2023). Here, we show that the subsidies that did get passed-through to lower prices did not

have a large effect on consumption quantities for store-bought food and especially meat, and likely increased the quantity of traditional foods consumed.

The rest of the paper is organized as follows: we first provide some more background on the history of traditional foods and government food policy vis a vis Indigenous people, then we discuss our data and some descriptive statistics on traditional foods in the Northwest Territories, followed by our main difference-in-difference estimation of the effects of Nutrition North transitions and an exploration of economic mechanisms.

2. Background

2.1. Traditional or “country” foods

Noting that the Food and Agriculture Organization (FAO) defines food security as “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life,” Indigenous organizations like Inuit Tapiirit Kanatami (which represents Inuit across Canada) emphasize “the centrality of harvested foods to our culture and way of life, as well as for meeting our dietary needs and food preferences” (Kanatami, 2021). These foods are described as “a pillar of Inuit culture, identity, and health and are a major source of food... an essential component of our physical and mental health, well-being, and spiritual sustenance and are demonstrably superior in nutritional value and quality.” They note that “the monetary value of harvested foods in Nunavut suggest that country food harvesting enables tens of millions of dollars in household savings when comparing harvested protein to store-bought sources of protein” and that “harvesting rights... are affirmed in Inuit-Crown land claims agreements.” These views likely apply to most if not all Indigenous peoples in Canada living in non-urban areas, although they are strongest in Canada’s North where as recently as a century ago these foods constituted close to 100% of local diets.

Burnett and Hay (2023) and Mitchell (1996) describe government policies that limited the acquisition and trading of traditional foods, including Provincial Hunting Laws that asserted that the state shall supervise and control this economic resource to maintain its viability in the long-run. The Ontario government initiated this process by passing “An Act to Amend the Act for the Protection of Game and Fur-Bearing

Animals” in 1892. Although this legislation permitted hunting for self-nourishment, it prohibited sales of this food. Enforcement of similar legislation and interpretation of treaty rights reduced the viability of hunting, prevented the emergence of a commercial sector for traditional foods, and made Indigenous communities more dependent on store-bought food exchanged for furs, crafts, and later government benefits. Given the importance of food sharing networks and ambivalence about commercialization, limitations on the growth of a commercial sector for traditional foods have also been supported by some Indigenous peoples at various times (Gombay, 2010).

Burnett and Hay (2023) also emphasize the role of Family Allowances from the 1940s to 1960s in eroding the food sovereignty of Indigenous peoples. This policy worked on multiple fronts. It incentivized peoples who had traditionally lived in low density, semi-nomadic and highly dispersed hunting camps to settle in permanent communities, to receive services and assimilate them into European “Western domesticity.” This had the – perhaps desired – consequence of eliminating Indigenous foodways, as it made access to traditional food sources more difficult (due to the limited ability of local wildlife to support a large population) and made access to store food easier. The policy also provided resources Indigenous families could use to purchase store food even as income from the fur trade declined, supporting profits of Northern retailers. In most communities, the Hudson Bay Company trading post – which had previously been at the center of a fur trade in which furs were exchanged for imported food but also hunting supplies – transitioned its main role from purchaser to retailer, as reflected in the creation of the “Northern Stores Department” in 1959. In many cases, Indigenous peoples were subject to “forced purchasing lists” which limited the set of goods on which they could spend their Family Allowance and excluded hunting supplies.

Policies that directly subsidize store-bought food, potentially at the expense of traditional food sources, continued through the Food Mail and Nutrition North Canada programs described in the next section. Although there are a number of programs that provide subsidies for traditional hunting/fishing activities (including in Quebec, Nunavut, and the Harvester Support Grant introduced by Nutrition North Canada in 2019), it remains the case that the cost of hunting and fishing is prohibitive for many households and has increased dramatically as Indigenous people switched from traditional hunting methods to capital intensive ones. Higher population density means hunters must travel farther than ever from their communities. Fuel is particularly

expensive in remote communities where there may be limited storage capacity and fuel is often flown-in.¹ Furgula (2016) describes the high cost of basic items, such as \$1,200 for a rifle, \$10,000 for a ski-doo or all-terrain vehicle (of which up to \$1,500 could be the cost of shipping by sea-lift²), or \$30,000 for a fishing boat and motor. Campbell et al. (2014) estimate the cost of an annual hunting outfit in Clyde River, Nunavut at \$55,719 and cite survey evidence that 21% of households state insufficient funds/hunting supplies as the main reasons for not being able to access country food.

Given these high costs of procuring country food and the professed desire to consume more of these foods (Campbell et al., 2014; Canada, 2016), lack of income may be a major constraint. Duhaime et al. (2002) show that within Quebec Inuit communities, access to a cash income raises the proportion of traditional foods in the diet. Hillemann et al. (2023) show that successful hunting is dependent on engagement with the cash economy, including wage labour. Traditional food sharing networks for country food – culturally important norms associated with kinship ties, respect for elders, and social status – have socio-economic correlates, with low-income households more likely to have food-receiving ties and high-income households having more food-giving ties (Hillemann et al., 2023). Wage employment often limits the time available for hunting to weekends and day trips. Thus constraints in terms of both time and money can impose limits on the ability of community members to consume country foods. Community consultations almost universally emphasize a desire to receive subsidies for hunting supplies (Canada, 2016).

Other factors affecting the decline in traditional foods include evolving preferences, loss of cultural knowledge and climate change (Hillemann et al., 2023). Decades of exposure to different foods combined with deliberate policy – “food guides” and propaganda about healthy eating, reinforced by subsidies that are focused on certain non-traditional foods (milk, frozen fruits and vegetables) – have likely reduced local preferences for traditional food. Traditional knowledge about animals and the land may have also declined. A review by Akande et al. (2015) indicates that in recent decades there was a particular shift away from traditional foods and towards energy-dense store-bought foods among younger Inuit. Crown-Indigenous Relations

¹To provide one example, in June 2024 a litre of gasoline cost \$2.83 in Sachs Harbour, NWT (<https://www.inf.gov.nt.ca/en/services/fuel-services/prices>) versus a Canadian average of \$1.62 (<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1810000101>).

²See <https://towniebastard.blogspot.com/2017/04/moving-to-igluait-faq-ver-60.html>.

and Northern Affairs Canada (2020) indicates that there is high demand for nutrition education initiatives focusing on traditional food knowledge and skills.

2.2. Nutrition North Canada transitions

The Food Mail program was introduced in a somewhat ad-hoc way in the late 20th century. The program provided flat-rate air freight through Canada Post for a specified list of item. Only communities that lacked year-round surface transport (road/rail/marine) were eligible for the program. Since 1993, shipping eligible perishables cost \$0.80 per KG and shipping eligible non-perishables cost \$2.15 per KG.³ These rates represented significant savings for more remote communities where commercial freight rates were substantially higher, resulting in heavy usage of the program in these communities (Evaluation, Performance Measurement, and Review Branch, 2009). While consumers had access to Food Mail rates for direct orders, most of the subsidized shipments under the program were received by retailers in remote communities. In some eligible communities that were closer to major air hubs, the program was rarely or never used because retailers could secure cheaper freight through commercial fares. In the Northwest Territories, there were ten eligible communities that used the program heavily (defined as more than 15,000KG per year and more than \$48 annual subsidy per person): Aklavik, Colville Lake, Deline, Fort Good Hope, Norman Wells, Paulatuk, Sachs Harbour, Tuktoyaktuk, Tulita, and Ulukhaktok. There were also three eligible communities that did not use the program heavily based on these criteria (Gameti, Whati, and Lutselk'e) and one (Wekweeti) that did not use the program at all (Standing Committee on Aboriginal Affairs and Northern Development, 2011). The list of eligible items excluded some foods deemed unhealthy, but included several non-food products, including some hunting equipment ("Fishing nets, rods and lures, snowmobile, ATV and outboard motor parts" – see Appendix B of Standing Committee on Aboriginal Affairs and Northern Development (2011)). In 2007-2008 the program was used to ship 18 million KG of freight, consisting of 82% perishable food, 13% non-perishable food and 5% non-food (Standing Committee on Aboriginal Affairs and Northern Development (2011)). The

³There were even lower prices to ship from Inuvik to four Northwest Territories communities (Aklavik, Paulatuk, Sachs Harbour, and Tuktoyaktuk) which was required to make Food Mail shipments more attractive than short-distance commercial fares and to make shorter air routes more attractive.

budgetary cost in the final year of the program (i.e. the subsidy implied by the flat rates relative to the cost of shipping ineligible products through Canada Post) was around \$60 million a year (Standing Committee on Aboriginal Affairs and Northern Development (2011)).

Four major reasons were provided for ending the Food Mail program and transitioning to the Nutrition North Canada retail subsidy (NNC), detailed in Standing Committee on Aboriginal Affairs and Northern Development (2011). First, the budgetary cost had expanded significantly in the late 2000s due in part to rising fuel prices. Under Food Mail, the Federal government was responsible for covering the difference between flat shipping rates and the actual costs incurred by Canada Post. NNC subsidies were paid directly to retailers and not tied to fuel prices. Second, concerns were expressed that the list of eligible items was too broad and there should be a narrower focus on more nutritious products given chronic health conditions in these communities. NNC refocused the subsidies on a narrower set of products and also included an education component including cooking classes, advertising, etc. Third, retailers argued that they could negotiate cheaper shipping rates than (unsubsidized) Canada Post, resulting in greater efficiencies. One estimate suggests that for 69 communities there would be an average saving of \$0.36 per KG just from switching from Canada Post to the cheapest commercial freight rate, yielding \$7 million in total savings (Standing Committee on Aboriginal Affairs and Northern Development (2011)). Fourth, the subsidies under NNC would be more transparent and visible to consumers. The implicit subsidy under Food Mail depends on differences between flat shipping rates and actual costs and these rates are not easily calculated by researchers or easily observed by consumers. NNC would pay a specified dollar subsidy to retailers per KG of eligible goods shipped to eligible communities, and this subsidy amount would be public information that was also recorded on shelf-prices and receipts.

Item eligibility was phased-out for Food Mail between March 2011 and March 2012, with NNC subsidies becoming active in April 2012. Many goods that were previously subsidy eligible under Food Mail lost eligibility, including ice cream, macaroni and cheese dinners, dried legumes, and bottled water. Nutrition North provides higher subsidies for goods like dairy, fruits and vegetables, fresh/frozen meat and fish, and lower subsidies for goods like butter, juice and flour.⁴ Nutrition North

⁴Note that commercialized country food is rare in Canada's North – there were only three process-

Canada has similar community eligibility criteria to Food Mail.⁵ More remote communities with higher commercial freight costs received higher NNC subsidy rates. Eligible communities that had used Food Mail but did not make heavy use of it (including the three communities in the Northwest Territories mentioned above) received a very low “partial” subsidy of 5 cents per KG, which is less than 0.5% of the value of the Revised Northern Food Basket used by officials to track prices.

The transition between programs was essentially budget neutral from a Federal perspective, as Nutrition north Canada received similar funding of about \$60 million in its first few years. Given our discussion above, there are several reasons this budget neutral reform could affect prices. First, the subsidy was paid to retailers directly rather than through subsidized Canada Post shipping. This could have resulted in logistical efficiencies if retailers could secure cheaper freight than Canada Post. It could also lead to different subsidy “pass-through,” perhaps due to increased transparency and accountability, although existing estimates suggest pass-through was incomplete and similar for either program.⁶ Second, the subsidies were re-allocated across communities and from a broader set of goods to a narrower set of goods, with higher subsidies for specific goods including fresh/frozen meat and fish. We believe that re-allocation across communities could have occurred but is less important, because NNC subsidies were set with equity across communities in mind, with explicit retail subsidy differences across communities tied to implicit Food Mail subsidy differences. Even the loss of NNC eligibility (or eligibility for a partial subsidy) for some communities simply reflected that these communities made little or no use of Food Mail, so little was gained or lost in the transition. The re-allocation of subsidies to-

ing facilities that used the program during the period of study – but this was eligible for a special shipping subsidy rate under Nutrition North. Existing evidence indicates that usage of this program was very low – for example, in the 2016-2017 fiscal year only 700KG of country food received shipping subsidies under this program, compared to 27.6 million KG shipped overall.

⁵The current, specific criteria are listed on the Nutrition North Canada website and consist of the following: (a) lack year-round surface transportation (no permanent road, rail or marine access), excluding isolation caused by freeze-up and break-up that normally lasts more than 4 weeks at a time, (b) meet the territorial or provincial definition of a northern community, (c) have an airport, post office, or grocery store, and (c) have a year-round population according to the national census.

⁶Galloway and Li (2023) show that pass-through of Nutrition North Canada subsidy increases in 2016 and 2019 were incomplete and around 67 cents per dollar for the average community. Glacken and Hill (2009) found a pass-through of around 69 cents per dollar from a pilot study that increased Food Mail subsidies (i.e. lowered freight rates) in three communities. Since retailers were the main users of both programs and can set prices that account for marginal cost reductions under either program, it is plausible that these findings of similar pass-through could apply to the transition, with pass-through differences playing a minimal role during the transition.

wards more nutritious, perishable goods in high usage communities was likely more important, since this was an explicit aim of the program reflected in both its name and explicitly stated objectives.

Previous studies show that the cost of the Revised Northern Food Basket (a food costing tool developed under Food Mail that continues to feature prominently in analysis of Nutrition North) fell as a result of the transition from Food Mail to Nutrition North (Crown-Indigenous Relations and Northern Affairs Canada, 2020). However, this food basket puts substantial weight on foods that receive higher subsidies and is not representative of actual consumption. To put the NNC subsidies in perspective, Galloway and Li (2023) estimate that for 83 communities reporting RNFB price data in December 2017, the average RNFB price was \$417 and the average RNFB subsidy content was \$113, which represents a 21% price reduction due to subsidy (assuming 100% pass-through) and an annual savings of \$5,876 per year for a family of four purchasing the RNFB every week. Estimating the subsidy content of the RNFB under Food Mail is not possible with available data. A more representative way of assessing the magnitude of the subsidy is to divide program spending by the affected population which is around 100,000 people. This implies a per capita benefit of \$600 per capita in 2011 under Food Mail and NNC in 2012, although the actual benefit to consumers under these programs depends on pass-through and potential efficiency gains.

Hunting equipment was no longer subsidized after the transition from Food Mail to Nutrition North. The combination of higher subsidies for fresh/frozen meat, and removal of subsidies for hunting equipment, has been criticized by observers who view these policies as a continuation of earlier assaults on traditional Indigenous foodways in favour of imported store food (Stephenson and Wenzel, 2017; Burnett and Hay, 2023). However, there are no data available on either the prices or quantities of hunting supplies before or after the transition from Food Mail and it is likely that any subsidy on hunting supplies had a small effect, both because the subsidy was lower for non-perishable items and because most non-perishable items (particularly vehicles) are shipped by seasonal surface freight. It is also unclear from published reports whether some key hunting supplies (like bullets) were subsidized, and fuel was definitely not subsidized.⁷

⁷According to a former retail employee in the region (personal correspondence), hunting supplies like bullets were sometimes flown in to Inuit communities when retailers misjudged demand between summer sea-lifts, but there is no evidence that Food Mail provided a major subsidy to hunting equip-

In October 2016, eligibility for the full Nutrition North subsidy expanded to 37 additional communities, some of which had previously been ineligible (due to non-usage of the program) and some of which had previously received only the partial subsidy (due to low usage – see the discussion above). This includes four communities in the Northwest Territories that are fairly close to Yellowknife by air and therefore rarely or never used Food Mail.⁸ Note that there were no changes in transport links for these communities that prompted the program expansion; rather, the expansion appears to have been the outcome of continued program consultations and advocacy that flagged the unfairness of excluding communities ineligible only due to low usage of Food Mail. Increased funding for the program may also have been related to political considerations such as the Liberal Party winning the 2015 election and sweeping seats in the Territories and Northern Ontario. Unlike the transition from Food Mail, this reform represents a pure increase in subsidies and injection of funds into these communities as there was no reduction in subsidies for any items. Galloway and Li (2023) show that subsidy increases from this reform were not fully passed-through to retail prices but that pass-through was well above zero, such that prices for subsidy-eligible items were still reduced substantially.

The NNC retail subsidy program has continued to evolve since then, with its total annual budget more than doubling from about \$60 million in 2012 to more than \$130 million in 2024. Most notably, given our focus here, the strong demand from community consultations and Indigenous leadership led to the creation of the Harvesters Support Grant as part of a package of subsidy reforms in 2019. This program allocates funds to Indigenous organizations (but not individuals) to subsidize harvesting trips, purchase of harvesting equipment, provision of training, and other activities. In combination with the Community Food Program, the government has allocated \$144.7 million to support 5,500 harvesters in over 100 eligible communities since the program's inception (Crown-Indigenous Relations and Northern Affairs Canada, 2023). As these reforms occur after our data on country food end, we do not consider them here, but this is an important and related research area if and when data become available.

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⁸A fifth community in the Northwest Territories, Sambaa K'e, is also eligible as of 2024 but was still not receiving the subsidy due to compliance/paperwork issues (personal correspondence).

2.3. Economic mechanisms for retail food subsidies to affect country food

In terms of the potential effects of the two reforms we consider – the transition from Food Mail to Nutrition North in 2011-2012 and the expansion of subsidies in some communities in October 2016 – there are two main economic mechanisms. Economic theory shows that the demand response for a good (e.g. traditional meat i) in response to the price change of another good (e.g. store food j) can be decomposed as:

$$\partial x_i / \partial p_j = \partial h_i / \partial p_j - x_j \partial x_i / \partial w \quad (1)$$

where x represents quantity, p represents price, h represents a Hicksian demand function and w represents income. This expression says that if the substitution between country food and store food ($\partial h_i / \partial p_j$) is low, store food is important in consumption (x_j is large), and traditional food is viewed as a “normal” good whose consumption rises with income ($\partial x_i / \partial w > 0$), a reduction in the price of store food could increase consumption of country foods. On the other hand if country food and store food are viewed as highly substitutable and/or country food is viewed as a “necessity” with a low or even negative income elasticity, a reduction in the price of store food could cause a decrease in the consumption of country foods.

The first term in the expression above is called the “substitution effect.” For reasons discussed earlier, the transition from Food Mail to Nutrition North Canada likely lowered the retail price of fresh/frozen meat and fish, along with some other more “nutritious” goods, but may have also raised the price of other food and non-food products (including hunting supplies). The 2016 reform likely lowered the retail price of similar goods without raising the price of unsubsidized goods (although we cannot rule this out with existing data). These relative price changes would be expected to lead to substitution away from country food and towards the now cheaper store alternative, which is precisely the concern articulated by some of the program’s critics. We can assess this mechanism in part by exploring whether quantities – of subsidized food, and meat/fish specifically – responded strongly to subsidy changes.

The second term in the expression above is called the “income effect.” Holding quantities constant at their initial level, price changes could result in an increase or a decrease in household expenditures. For the second reform we study – the expansion of subsidies in 2016 – this income effect is likely to be positive because subsidies

only increased. For the Food Mail to Nutrition North Canada transition the income effect is more ambiguous. Some communities may have received modest increases or decreases in overall subsidies, and pass-through of a given subsidy amount could be higher or lower for Food Mail versus Nutrition North Canada subsidies. Changes in item eligibility likely resulted in higher prices for some items and lower prices for others, resulting in positive income effects for some consumers (e.g. those that disproportionately purchased the goods with subsidy increases) and negative income effects for others. The income elasticity of country foods is unclear, but several studies cited earlier indicate a positive association with total income or market wages within community. Survey evidence suggests that income is a barrier to hunting and that most households would consume more country food if they could (Campbell et al., 2014). Note that the income effect associated with retail subsidies does not put constraints on hunting time, unlike increases in employment income. We are not aware of evidence on the sign or magnitude of income effects from non-labour income on country food consumption in similar settings. Theoretically, the relative magnitude of the substitution and income effects dictate whether the retail subsidies increase or decrease country food consumption and production. The rest of the paper empirically investigates this reduced form relationship and provides some evidence on these mechanisms.

3. Data and descriptive statistics

Our main source of data are the NWT Labour Force Survey and NWT Community Surveys that were conducted in 1998, 2003, 2008, 2013, and 2018 by the Northwest Territories (NWT) Bureau of Statistics. The surveys are conducted for all 34 communities in the territory that can be aggregated into six regions (Beaufort Delta, Dehcho, Sahtu, South Slave, Tlicho and Yellowknife area). These communities range in size from tiny (Kakisa and Jean Marie River which have under 30 households) to the capital Yellowknife (over 7,000 households in 2018) with a sample median of 132. The survey is a household census in the smaller communities and a random sample in the larger communities, and asks respondents a variety of questions, including household income (all years but missing for some communities), food insecurity (the share of households reporting that they are “worried about not having enough money for food,” 2018 only) and Indigenous identity (from 2008 onwards).

The main outcomes of interest for our analysis are those related to consumption of country food and those related to hunting/fishing activity. For consumption, we have data on the share of households in the community who self-report obtaining 75% or more of the meat or fish they consume through hunting or fishing for all years from 1998 to 2018, with almost no missing observations (which occur due to disclosure risk). From 2003 to 2018 we also have the individual count of households with responses in different cells (over 90%, over 75%, over 50%, over 25%, over 10%, over 0%, and 0%). While these data have more missing cells for small communities, they allow us to use different thresholds of consumption. For our main analysis, we supplement the share of households with over 75% country food measure with the share of households with any country food and a measure that combines extensive and intensive margins we call the “aggregate country food share.” To compute the latter, we assume that all households consume the same quantity of meat regardless of their self-reported country food share, which allows us to multiply the number of households in each cell by the mid-point share of that cell (e.g. we assume that households in the over 90% cell have a 95% share, those between 75% and 90% have an 82.5% share, etc.) and sum across all cells to get an “aggregate” country food share at the community level. To deal with missing cells, which are only an issue for the smallest communities, we can either consider equal weight imputation (e.g. we take any unallocated households and assume they are equally distributed across censored cells) or drop those communities from the analysis.

For hunting and fishing, we have self-reported data on the share of individuals aged 15 and up who engaged in hunting or fishing in the previous year along with various frequencies – frequently, occasionally (more than day trips), occasionally (only day trips), rarely, and ever – for all survey years between 1998 and 2018. These data have a similar issue of missing cells but allow us to consider different thresholds of hunting frequency. We consider three main measures that roughly correspond to the ones we analyze for consumption – the share of individuals that engage in frequent or occasional (more than day trips) hunting/fishing (the two highest categories combined, analogous to the over 75% threshold for consumption), the share that did any hunting/fishing (analogous to the share that consumed any country food), and an aggregate hunting share (analogous to the aggregate country food share described above). The latter is arbitrary as there are no specific frequencies that correspond to the different frequency categories, but we find similar or stronger re-

sults using a principal components analysis which suggests that our arbitrary aggregation captures meaningful variation.⁹ Starting in 2008 we also have data on whether a person aged 15 or older ever hunted/fished in the previous year disaggregated by Indigenous identity. We also have a measure of whether persons aged 15 or older engaged in trapping during the previous year for all survey years.

We supplement these data with a Food Price Index compiled from the Community Price Surveys that are also administered by the Northwest Territories Bureau of Statistics. These data are available for different years than the Community Survey – 1997, 2000, 2001, 2004, 2010, 2012, 2015 and 2019 – and express food prices for each community relative to Yellowknife (=100).¹⁰ Food prices are Food Mail or NNC subsidy inclusive but exclude sales tax. The data are not meant to capture price changes over time and the documentation cautions that “data may not be comparable over time due to methodological changes.” The survey aims to collect prices for approximately 300 products in every grocery store in every community, with an attempt made to match brands and pack sizes when possible. Price differences are calculated relative to Yellowknife and averaged within each product group corresponding to a category in the Yellowknife CPI, and then aggregated using Yellowknife CPI expenditure weights across categories.

In addition to these data collected by the Northwest Territories Bureau of Statistics, we use public information from historic and current websites of Nutrition North Canada (NNC). We use price data for the Revised Northern Food Basket (RNFB). This is a fixed weight food basket consisting of 67 items that was determined to constitute a nutritionally adequate diet for a family of four over one week. Importantly, the RNFB was developed by nutritionists and adapted to local tastes, but is in no ways representative (unlike the NWT Food Price Index, which has more coverage of unhealthy and processed foods). RNFB prices on the current NNC website are available going back to the program’s inception. We use archived versions of government websites to collect RNFB prices as far back as 2005 when Food Mail was operating, but note that the data collection methodology changed (under Food Mail, there were spot checks by inspectors but under NNC retailers send price data directly to the

⁹Specifically we assume that “frequently” corresponds to 75% of the time, occasionally (more than day trips) to 25% of the time, occasionally (day trips only) to 12.5% of the time, and ever to 5% of the time. The correlation of this measure with the principal component (based on the shares in each cell) is over 0.95.

¹⁰This reflects the limited manpower available to the agency to collect data in-community.

program officials). After 2011, RNFB prices are only available for communities that receive a full or partial (prior to 2016) Nutrition North subsidy, which is a limitation compared to the NWT Food Price Index. All RNFB price data exclude sales tax but include the Food Mail or NNC subsidy. We also use NNC data on the quarterly data on the subsidy value and quantity of subsidized foods shipped to each community, disaggregated by category, focusing on the “all food” and “meat” categories.

We use publicly available current and historic information on NNC to determine NNC program “treatment groups.” The Northwest Territories has 10 communities that were eligible for Food Mail and transitioned to a full Nutrition North subsidy by 2012 (Aklavik, Colville Lake, Deline, Fort Good Hope, Norman Wells, Paulatuk, Sachs Harbour, Tuktoyaktuk, Tulita, and Ulukhaktok), and four more that transitioned from zero or partial subsidy to full subsidy in October 2016 (Gameti, Wekweeti, Whati, and Lutselk’e). We consider these distinct treatment groups that are non-overlapping and divide our sample into three groups: the ineligible, the eligible in 2011-2012, and eligible in 2016. While four of the eligible in 2016 communities technically lost access to Food Mail in 2012 and three received a partial NNC subsidy on April 1st 2012, the value and usage of both Food Mail access and the partial subsidy were extremely low for these communities so we consider them untreated until 2016.¹¹ The remaining 20 communities, which include both populous and low Indigenous-share communities like Yellowknife and Hay River, as well as very small but high Indigenous share communities like Kakisa and Jean Marie River, constitute a “never-eligible for NNC” control group.

Table 1 presents summary statistics for our main variables by treatment group and year. We see that the never eligible communities are larger on average and have the lowest Indigenous population share (which would be much lower if we weighted by population), while the eligible in 2016 communities are the smallest and have the highest Indigenous population share. The eligible in 2011-2012 communities that used Food Mail heavily are the most remote, as expected.¹² Median household in-

¹¹Recall that these communities had an implied subsidy value below \$48 per person annually in order to not qualify for a full subsidy according to the government’s calculations and that the value of the partial subsidy amounted to less than 0.5% of the average cost of the RNFB. Our calculations indicate that for the NWT communities using partial NNC subsidies before 2016, the average annual value of subsidy paid per household was \$12.72.

¹²The remoteness index is constructed by considering a community’s population size and distance to all the population centers for a given travel radius (Statistics Canada, 2022) and ranges from zero to one, where higher values showcase greater degree of remoteness.

come is fairly similar across communities but somewhat lower in the 2011-2012 eligible communities, but note that there are also important differences in household size (comparing households versus persons aged 15 and older for example). The 2018 food insecurity rate is highest in the 2016 eligible communities. Turning to the main outcomes of interest, the importance of country food in consumption and hunting frequency all tend to be highest in the 2016 eligible communities and lowest in the never eligible communities. There appears to be an overall downward trend in these activities but the shares are still large – we estimate that the aggregate share of country food in meat/fish consumption for the average community ranges from about half (for the never eligible) to two thirds (for the eligible in 2016) even in 2018.

Hunting activity is generally below country food consumption, which is consistent with the notion that not all household members hunt regularly and there is some degree of specialization both within the household and across households (with traditional food sharing networks allowing households with no hunting members to also consume some country food). After 2008 we have separate data on hunting by Indigenous identity and we see that Indigenous individuals are more likely to hunt. Comparing across communities in 2018, we also observe positive correlations of the share of Indigenous households with hunting (0.47) and trapping (0.51). Trapping is rare relative to hunting but still practiced by more than 10% of households for every group of communities.

The bottom of the table presents the NWT Food Price Index data, which indicates that the most remote communities that relied heavily on Food Mail (the eligible in 2011-2012 communities) have the highest prices relative to Yellowknife, followed by the 2016 eligible communities. The trend is unclear from these data but there is some suggestion that prices may have fallen for the eligible in 2011-2012 communities after 2008 and the 2016 eligible communities after 2013.

Figure 1 displays some of these same data visually to assess trends over time for the three groups of communities. The data are somewhat noisy year to year and suggest that annual variation in hunting prospects (related to climate, animal migrations, etc.) may play an important role, but point to a generally decreasing trend for country food consumption but increasing trend for hunting. It is difficult to tell visually whether the trends are parallel between the different groups given the limited number of data points, but the parallel trend assumption seems reasonable for some groups and outcomes. Visual inspection provides a hint of our main findings,

which is that NNC reforms lead to modest increases in country food consumption and collection, with somewhat larger effects for the 2016 eligibility group than the 2011-2012 eligibility group (which is sensible given our interpretation as the latter likely experienced a smaller decrease in prices and hence a smaller income effect).

Figure 2 displays a scatter plot highlighting important variation within these groups as well as across them as well as the correlation of these variables with country food consumption in 2018. The most populous and lowest Indigenous share communities, Yellowknife and Hay River, are outliers for many of these variables. The plot shows that harvest (hunting/fishing) frequency is strongly correlated with the share of households with a high importance of country food. The Indigenous share is also strongly correlated with the importance of country food although this is partly driven by the six communities with below 80% Indigenous share – the correlation is less clear for communities above this threshold. Food insecurity and income display an inverted U-shape pattern with both the highest and lowest communities having lower shares of country food and intermediate communities having the highest shares. For income, this relationship is also likely confounded by Indigenous identity, as the richest communities have the lowest Indigenous population shares, and the correlation with income appears to be positive for the 28 communities with above 80% Indigenous population share. Remoteness appears to be positively correlated with country food overall, which may be due in part to lower population densities and better hunting prospects in remote regions. Finally, there is a positive but noisy correlation of retail food prices and share of country food. Altogether, these data suggest that certain variables are strongly linked to the importance of country food but others display a more ambiguous and non-monotonic relationship, with many potential confounding factors (e.g. income, prices, remoteness/availability of country food, Indigenous share) interacting to shape the intensity of country food consumption and production. Given this complexity and a limited sample size, we do not delve further into the cross-sectional correlations and instead leverage the panel dimension of the data and the plausible exogeneity of our two NNC reforms to provide insight into how policy changes may have affected the evolution of country food consumption and production during this period.

4. Estimating the effects and mechanisms of Nutrition North Canada transitions

To assess whether the Nutrition North Canada retail subsidies had an effect on traditional food consumption and production between 1998 and 2018, we employ a difference-in-difference framework. Specifically, we analyze the effect of two retail subsidy treatments that we call FM-NNC transition (equal to one for 10 communities after 2011 but zero otherwise) and NNC2016 transition (equal to one for 4 communities after 2016 but zero otherwise), while controlling for community fixed effects and year fixed effects (or year-region fixed effects). Note that no community is treated twice because the NNC2016 communities only made trivial use of Food Mail or the partial subsidy if they were eligible. Community fixed effects account for time-invariant features of communities that affect traditional food consumption and collection, including the local hunting/fishing environment, colonial history, and to a large extent population size, income and Indigenous population share (these vary over the two decades of our study but not to a large degree). Year, or year-region, fixed effects account for changes in average prices (for inputs to country food collection like gas and equipment as well as store food) as well as climate, animal migration, and other policy changes that may lead to common changes over time at the Territory or region level. We estimate specifications like:

$$\ln(\text{share})_{it} = \alpha_i + \gamma_t + \beta_1 \text{FMNNCtransition}_{it} + \beta_2 \text{NNC2016transition}_{it} + \epsilon_{it} \quad (2)$$

The coefficients β_1 and β_2 can be interpreted as the percent change in the share of households consuming or collecting country food due to the retail subsidy changes. The key assumption to interpret this as a causal effect is that there are no differential trends correlated with treatment status, which we will explore more formally by considering whether pre-trends are correlated with treatment status.

With 34 communities we have up to 170 observations, but there are some missing values for small communities (e.g. Enterprise is missing data for consumption, Ndilo is missing data for hunting and consumption) and most of our country food consumption outcomes are missing for 1998. In some specifications we control for median household income, Indigenous population share, or drop the largest (Yellowknife region) and smallest (Kakisa, Jean Marie River) communities, which re-

quires dropping additional observations. Given the small number of communities (up to 34) and small number of treated communities (as few as 3 for the NNC2016 treatment in some specifications), we conservatively report wild-cluster boot-strapped confidence intervals and p-values (for the the null of zero effect) in lieu of asymptotic standard errors. We weight all regressions by the relevant population used to construct the dependent variable, i.e. by number of households for consumption and by number of persons aged 15 and up for hunting/fishing/trapping, and also control for this population directly.

4.1. Effects of Nutrition North Canada subsidies on country food consumption and hunting

Table 2 presents our main results for three country food consumption outcomes – the share of households consuming more than 75% of their meat/fish from country food (Panel A), the share consuming any country food (Panel B), and the aggregate country food share (Panel C, described earlier) – with the last two outcomes missing data for 1998. Column 1 presents the basic specification shown above, while column 2 includes region by year fixed effect that account for common regional factors that vary over time. Importantly there is variation in treatment status within each region, e.g. communities like Inuvik and Fort MacPherson provide a comparison for other Inuvik/Beaufort-Delta region communities and Behchoko provides a comparison for the other Tlicho communities. Columns 3 through 5 consider specifications that require dropping some observations. Column 3 drops the Yellowknife region communities and the two smallest communities (Jean Marie River and Kakisa). Column 4 includes household median income, which requires dropping several smaller communities in some years – most of these never receive NNC subsidies (Jean Marie River, Kakisa, Detah, Nahanni Butte, Sambaa K’e, Tsiigehtchic, Wrigley) but two are in the FM-NNC transition group (Colville Lake, Sachs Harbour) and one is in the NNC2016 transition group (Wekweeti), reducing the number of treated units from 10 to 8 and from 4 to 3 respectively. Column 5 includes the Indigenous population share, which leaves the set of communities unaffected but requires dropping the years 1998 and 2003.

The results of this analysis indicate that the two NNC transitions we consider resulted in increased country food consumption. The estimated treatment effects are

uniformly positive but noisy. Confidence intervals generally reject large negative effects and many of the estimated coefficients are significantly different than zero at the 5 or 10% significance level. The effects are largest and most robust for the more intensive measure (Panel A) but the least intensive measure (Panel B) and the aggregate measure combining intensive/extensive margin measures (Panel C) all suggest that country food consumption moves in a positive direction. The coefficient magnitudes are typically larger for the 2016 transition than the Food Mail transition but also noisier, which is not surprising given that there are only 4 (or 3, depending on the specification) treatment communities and we use a conservative wild-cluster boot-strap. Appendix Table 1 shows that we find similar results using other frequencies (10, 25, 50, and 90).

Table 3 presents our main results for the three analogous country food collection/production outcomes – the share of persons aged 15 and up that hunt/fish frequently/occasionally (more than day trips) (Panel A), the share that hunted/fished at all in the last year (Panel B), and an aggregate measure combining intensive and extensive margins (Panel C, described earlier). Columns are analogous to Table 2 and the number of observations, communities, and treated communities differ across columns in a similar way (with minor differences in which small communities are dropped for non-disclosure reasons).

Similar to Table 2, all of the estimated treatment effects in Table 3 are positive, and in this case the 2016 transition estimates are uniformly larger than the Food Mail transition estimates. The coefficient estimates for the most intensive measure of hunting (Panel A) are all significantly positive at and in many cases below the 10% level, while we cannot reject that the estimates for the least intensive measure are zero (Panel B). The more intensive measure of hunting activity in Panel A may be more associated with quantitatively important country food consumption, while the measure in Panel B may largely reflect changes in recreational hunting that are not as quantitatively important. The measure in Panel C that combines hunting intensive and extensive margins also exhibits statistically significant treatment effects at conventional levels for the Food Mail transition and some marginally significant results for the NNC2016 transition, but as the aggregation we adopt is arbitrary these are just suggestive. In Appendix Table 2 we find that when we use the principal component of the different hunting/fishing frequency share estimates as the dependent variable we find large and significant treatment effects of both reforms. We also show that the results of

Panel A are not sensitive to imputation of missing cells, and that treatment effects are in the same direction but often smaller and noisier when we use only the highest hunting intensity (share hunting/fishing frequently only) or lower hunting intensity measures (share hunting/fishing occasionally (day trips only) or more).

Overall these findings, combined with those from Table 2, suggest that the largest effects on country food collection are at the intensive margin (across adults) but for consumption they are driven by both intensive and extensive margins (across households). Note that changes in the share of persons aged 15 and up that identify as Indigenous between 2008 and 2018 have no significant association with changes in country food consumption but a significant positive association with hunting/fishing activities. Median household income has a negative association with country food consumption and a positive association with country food collection, but the estimates are not significantly different than zero at conventional levels. The within-community variation in these variables is too small to estimate precise effects, and the income variation here does not provide a good test of income effects related to the subsidy reform. This income variation is not exogenous, and is largely driven by changes in labour income (see Daley et al. (2024a)), which is associated with changes in labour supply and time available for hunting/fishing that could offset any positive effects on demand for country food versus store food and affordability of hunting inputs.

Table 4 considers three additional outcomes that shed more light on Indigenous traditional activities. Column 1 uses the share of households that trapped in the previous year with a specification analogous to column 2 of Tables 2 and 3. Columns 2 and 3 break down the share hunting/fishing in the past year by Indigenous identity, which is possible for the years 2008 through 2018 (hence the specification is similar to Column 5 of Panel B of Table 3 but dividing outcomes by Indigenous identity rather than controlling for it at the community level). We find effects on trapping that are positive but not significantly different than zero. Note that trapping activity is much lower than hunting/fishing activity in these data and trapping is sometimes but not always associated with meat consumption. Hunting/fishing activity of Indigenous identified persons appear to be more responsive to the NNC transitions than that of non-Indigenous persons and the base shares are also higher (see Table 1), confirming the centrality of hunting/fishing to Indigenous identity and its stronger association with retail food subsidies for this population.

To assess whether there are any major pre-trends associated with either Nutrition North transition, we consider a dynamic difference-in-difference specification given by:

$$\ln(\text{share})_{it} = \alpha_i + \gamma_{rt} + \sum_{j=2003}^{2018} \beta_1^j FMNNtransition_i * d_t + \sum_{j=2003}^{2018} \beta_2^j NN2016transition_i * d_t + \epsilon_{it} \quad (3)$$

where d_t is a dummy variable equal to 1 if $j = t$ and we include region by year fixed effects as in Table 2 column 2. The β^j coefficients then represent the “effect” of the transition at different horizons, relative to the omitted category (which we choose to be the year before each transition for the treated communities, 2008 and 2013). If the transitions were exogenous and uncorrelated with trends across communities, we would expect these coefficients to be significantly different than zero only in the periods after the transition took place.

Figure 3 plots the coefficients from this exercise for Tables 2 and 3 Panel A, along with a boot-strapped 95% confidence interval. Analogous figures for Panels B and C of these Tables are provided in the Appendix Figures 1 and 2. While estimated confidence intervals are large, especially for the 2016 NNC reform, the estimates do not show evidence of important pre-trends and some of the individual coefficients in the post period are significantly different than zero at conventional levels. Given the low power of these tests and the short time-series, these findings should not be viewed as definitive, but combined with the robustness of results to region-year fixed effects they lend support to a causal interpretation of our findings. Our findings in the next section on lend further support to a plausible causal economic mechanism through which NNC reforms increased country food consumption and production.

4.2. Economic mechanisms

Our earlier discussion of economic theory noted that retail subsidies could increase country food consumption if they (a) lower retail prices, (b) this results in limited substitution effects, and (c) there are large income effects (because households save a lot of money and there is a positive income elasticity of country food consumption). To assess the plausibility of these economic mechanisms, we first establish that the transitions we study did in fact lower prices. We do not observe the universe of prices and available product-level price data are very limited, so we cannot rule out

that the transition from Food Mail to NNC (or the 2016 NNC reform) resulted in higher prices for some goods, but the data we have from the NWT Food Price Index and the RNFB cover a large and important set of goods. The NWT Food Price index uses CPI expenditure weights that are representative for Yellowknife and includes over 300 items. The RNFB is not representative and only covers 67 items but includes many important ones, such as major sources of frozen/fresh store-bought meat. Not that there is only a limited literature establishing the price effects of the transitions we study so this price analysis is an additional contribution of our study.¹³ Thus, in what follows, we provide the first difference-in-difference analysis of food price effects from the Food Mail to NNC transition using two different data sets, and highlight the relative size of the price effects for the 2016 NNC transition communities.

Table 5 presents results from our price regressions. Panel A uses the NWT Food Price Index as the dependent variable, either in levels (where numbers are expressed relative to Yellowknife=100) or in logs. We use data for the years 2004, 2010, 2015 and 2019. Since the NNC subsidies came into effect on April 1st 2012 (following the phase-out of Food Mail between April 1st 2011 and then), 2012 has been excluded from the NWT price analysis. We implement similar difference-in-difference regressions with community fixed effects and either year or year-region fixed effects. Our variables of interest are the indicators for the FM-NNC transition or the NNC2016 transition. Note that the years are different than for the NWT Community Survey, which adds an additional complication – the only post-reform observation for the 2016 NNC transition communities is for 2019, but in 2019 subsidies were further increased for all NNC-eligible communities including both the 2016 transition communities and those that were eligible as a result of the FM-NNC transition. Thus we include an additional indicator equal to one for periods when a community benefits from the 2019 subsidy increase. The 2016 NNC transition coefficient is thus only identified relative to the FM-NNC communities.

Our results indicate that the FM-NNC transition led to substantial reductions in prices for the broad set of goods in the NWT Food Price Index, equivalent to between 16 to 26 points (expressed relative to Yellowknife prices) or 10-15% (expressed

¹³Crown-Indigenous Relations and Northern Affairs Canada (2020) shows that prices for the RNFB were lowered between March 2011 (before Nutrition North was phased in) and March 2012 (after it was phased in) but did not consider a control group. Galloway and Li (2023) show the October 2016 subsidy eligibility changes were not fully passed-through but still lowered RNFB prices in the communities that transitioned from a partial to a full subsidy.

as a relative-relative percentage price change). The magnitude of the effect is quite sensitive to the inclusion of year-region dummies, highlighting the sensitivity of the results to within versus across regional variation given the small samples sizes. The 2016 NNC transition coefficient is also negative but smaller in magnitude (up to 10 points or 7%) and not statistically significant at conventional levels. Because the 2016 NNC transition effects for 4 communities are only identified relative to the FM-NNC transition communities (consisting of 10 communities) the estimates are very noisy and sensitive to the inclusion of region-year fixed effects; our finding here that the price effects are smaller than for the FM-NNC transition will be reversed when we consider a larger sample.

Table 5 Panel B uses quarterly RNFB price data for all available communities, not just those in the North West Territories, from 2005 to 2018. This provides much more power for the estimation as we have up to 88 communities, but note that many of the NWT communities in our main NWT sample are excluded (either because they are not NNC eligible, or for other reporting reasons) and we cannot conduct a sub-sample analysis for the NWT only using these data. Note that the control group for assessing the Food Mail to NNC communities in this case are communities that transitioned to a partial subsidy, and the control group for the 2016 transition communities are communities that already received an NNC subsidy. We use similar specifications as before, only here we use quarter and quarter-province fixed effects. Our estimates confirm that there was a sizable effect of the FM to NNC transition with a magnitude somewhat smaller than what we observe in Panel A, with a price reduction equivalent to 3-4%. In dollar terms, this is \$12-\$17 per week (\$624-\$884 per year) for a nutritious food basket that is adequate for a family of four. The effects of the 2016 transition were even larger, in the 6-7% range (\$1300-\$1550 per year).

These estimates highlight that both subsidy reforms lowered the prices of many foods to a substantial degree, with some uncertainty about the relative magnitudes of the FM-NNC and 2016 transition price effects. The RNFB estimates are much more precise but are based largely on communities outside the NWT, while the NWT Food Price Index estimates are noisy given the limited variation available to identify the effects of the 2016 transition. Overall, we view this evidence as supporting the plausibility of the economic mechanism we propose, which is that the subsidy reforms led to large decreases in prices for an important set of foods that includes fresh/frozen meat, potentially generating large savings for households.

To shed more light on the substitution effect and potential magnitude of the income effect, we look at comprehensive data on the volume of subsidized food shipped to communities. Although we are not aware of any community-level data on quantities shipped under Food Mail, NNC collected quarterly data on the subsidy value and weight of subsidized shipments to each community between 2012 and 2018 that we can use to assess these questions and the impact on the 2016 transition communities.¹⁴ We first note that for our NWT sample communities that receive NNC subsidies, the dollar value of the subsidy is quite high – about \$3,000 per household in 2017-2018 for the communities that transitioned from Food Mail and \$2,000 per household for communities that became eligible in 2016. The quantity of subsidized goods shipped is also high, with an annual mean of 890KG and 784KG per household respectively. However the share of subsidized meat in this total is fairly low – approximately 16% in terms of subsidy value or weight. This suggests that most of the subsidy went to lowering the cost of non-meat foods that might be more complementary with country food, and there is less likelihood of substitution.

We use the community-level subsidy value and weight of subsidized shipments to explore the effect of the 2016 transition using a difference-in-difference framework similar to our earlier analysis. We consider both a sub-sample restricted to NWT communities, and the full sample of NNC communities that were previously eligible (control) or became eligible (treatment) in October 2016 for the full subsidy. Because we are trying to capture changes in the quantity of store-bought food, rather than the quantity of subsidized store-bought food, we restrict our sample further to only communities where per capita shipments of subsidized food exceed 100KG (or approximately 2KG per week), which means that the transition communities we consider are only those that had and used a partial subsidy before October 2016 (and therefore reported large quantities of subsidized shipments, despite small subsidy values). For communities that were not eligible for any subsidy before October 2016 or that barely used the partial subsidy, reported quantities are zero or close to zero which is obviously a poor proxy for consumption and sales of goods that only later received large subsidies. Only Lutselk'e meets this criteria in the North West Territories as Whati and Gameti were partial subsidy eligible but report virtually no

¹⁴In terms of aggregate shipments, Standing Committee on Aboriginal Affairs and Northern Development (2011) estimates that 18 million KG of cargo was shipped under the Food Mail program in 2007-2008, which can be compared to a volume of about 26 million KG subsidized by NNC during each of the first two fiscal years.

subsidized shipments before 2017, so we are essentially comparing the increase in quantity for Lutselk'e versus the ten NWT communities that were already eligible for the full subsidy.¹⁵ For the whole Canada sample there are 85 total communities of which 8 made substantial use of the partial subsidy and later transitioned to a full subsidy.

Table 6 presents the results. Columns 1 and 2 report diff-in-diff estimates for the annual dollar value of subsidies for all goods and for meat/fish only (all variables are measured in per capita terms, dividing by the 2016 census population). Columns 3 and 4 report diff-in-diff estimates for the annual kilograms of subsidized goods shipped for all goods and for meat/fish only, and columns 5 and 6 report similar results for log quantities, so estimates are semi-elasticities of quantity with respect to the 2016 transition. We code the transition as equal to 0.25 in the year 2016 given that subsidies increased in October 2016, and one thereafter, and restrict the sample to the years 2012-2018 so there are no other changes in subsidies. Panel A presents results for the NWT communities. As expected, the estimates are very noisy given the limited number of communities and the single treatment community. The point estimates in columns 1 and 2 are consistent with large savings for households – and hence a large income effect – equivalent to over \$600 per person per year, with 13.5% of the increase in subsidy value coming from meat. The change in quantities is smaller, at 28KG per person overall and only 1.7KG per person for meat, corresponding to 11% and 4% increases in quantity respectively. These results imply that subsidized meat consumption was less responsive than other product categories and – given that fresh/frozen meat received the highest subsidy level – had a lower subsidy elasticity. While these results are suggestive, they are perhaps too noisy to reach any firm conclusions.

Panel B expands the sample to all communities in the data that made heavy use of NNC subsidies before 2016. Compared to Panel A, the subsidy value estimates in Panel B columns 1 and 2 are somewhat smaller, and the quantity response estimates in columns 3 through 6 are at least twice as large. All the coefficients are estimated with greater precision and the overall pattern is similar – the increase in subsidy

¹⁵Note that this difference in usage of the partial subsidy was likely idiosyncratic and related to the same compliance/paperwork requirements that have prevented one eligible NWT community (Samba K'e) from using the NNC subsidy even to this day. All of the 2016 NNC transition communities in the Northwest Territories are independent/community-owned stores, and it appears that Lutselk'e was the only one where the management decided the compliance costs were worth receiving the partial subsidy.

value per capita is substantial, generating potentially large income effects, and the response of meat quantities is relatively low, particularly in absolute terms.¹⁶

Overall, our findings here add to the plausibility of our main results and the conventional economic mechanisms that could explain it. The Nutrition North Canada transitions lowered the price of a broad set of foods but only a small share of the subsidy went to store meat that seems likely to be the closest substitute for country food. There was only a modest response in terms of quantities of (subsidized) store foods and an even weaker response in terms of quantities of subsidized meat. The substantial savings from the 2016 NNC transition – amounting to 2.6% of median household income – appear to have had a limited effect on demand for store food, particularly meat, and enabled households to increase their consumption and collection of country foods through (non-market labor) income effects.

5. Conclusion

Our findings contradict the notion that the Nutrition North Canada retail subsidies have contributed to the declining consumption of traditional country foods in recent decades. Despite potentially increasing the cost of some hunting supplies, and lowering the price of store foods such as meat, the net effect of the transition from Food Mail to NNC and the expansion of full subsidy eligibility to many communities in 2016 was to save households money, which enabled them to meet a high and unsatisfied demand for more country foods.

Importantly, our results should not be taken to imply that retail subsidies for imported food are the best way to support these communities and their stated desire

¹⁶Note that the point estimates in Table 5 and 6 for the 2016 NNC reform are consistent with own-price elasticities for subsidized foods ranging from inelastic (e.g. a 6.7% increase in meat quantity from a 7.4% reduction in prices) to fairly elastic (e.g. a 24% increase in subsidized quantity from a 6% reduction in prices) and the standard errors are large enough to be consistent with a range of elasticities. However it should also be noted that the relevant substitution elasticity for considering income effects is one that looks at total store expenditures, which we do not observe, and it is plausible that the increase in quantity for subsidized goods we observe was offset by decreases in quantity (and spending) for unsubsidized store food, so even with more precise estimates of price and quantity effects for subsidized store food it would be difficult to assess how much households “save” on total store food purchases. The quantity elasticities in Table 6 are smaller or comparable in magnitude to the consumption effects estimated in Table 2 but have a different interpretation, since the former reflects absolute quantities and the latter reflects shares; to the extent that store meat quantities increase, this suggests an even larger increase in country food quantities than a scenario with constant store meat quantities.

for food sovereignty and greater support for the traditional food sector. Our results imply that any increases in income are likely to support this goal, and may have an even larger effect per dollar, depending on how the income is distributed and how it affects store food prices (see Daley et al. (2024a)). Moreover, we are unaware of any quantitative evaluations of the effectiveness of direct support to harvesters, despite the existence of numerous provincial/territorial programs and the introduction of the NNC Harvester Support Grant in 2019. How these programs affect traditional food collection, distribution, consumption and other outcomes is an important topic for future research.

Future work in this area could also use other data sources that record traditional food consumption and production such as the Aboriginal Peoples Survey and Inuit Health Surveys and consider data for more recent periods as it becomes available. In addition to providing a larger sample size to examine the effects of NNC transitions we consider, this would also allow for an analysis of the large increases in subsidies that occurred in 2019 and 2020. Future work could also explore the effect of exogenous income transfers such as Canada Child Benefit expansion and COVID-19 benefits on the collection and consumption of traditional foods.

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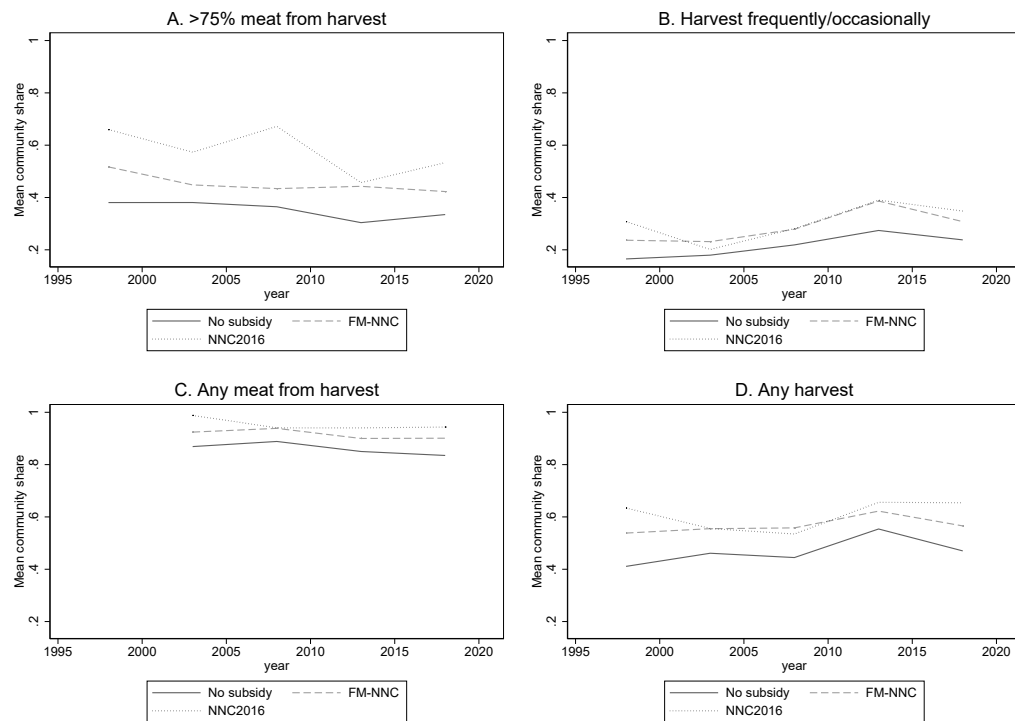


Figure 1: Trends in country food consumption and collection in the NWT Community Survey by NNC eligibility group between 1998 and 2018.

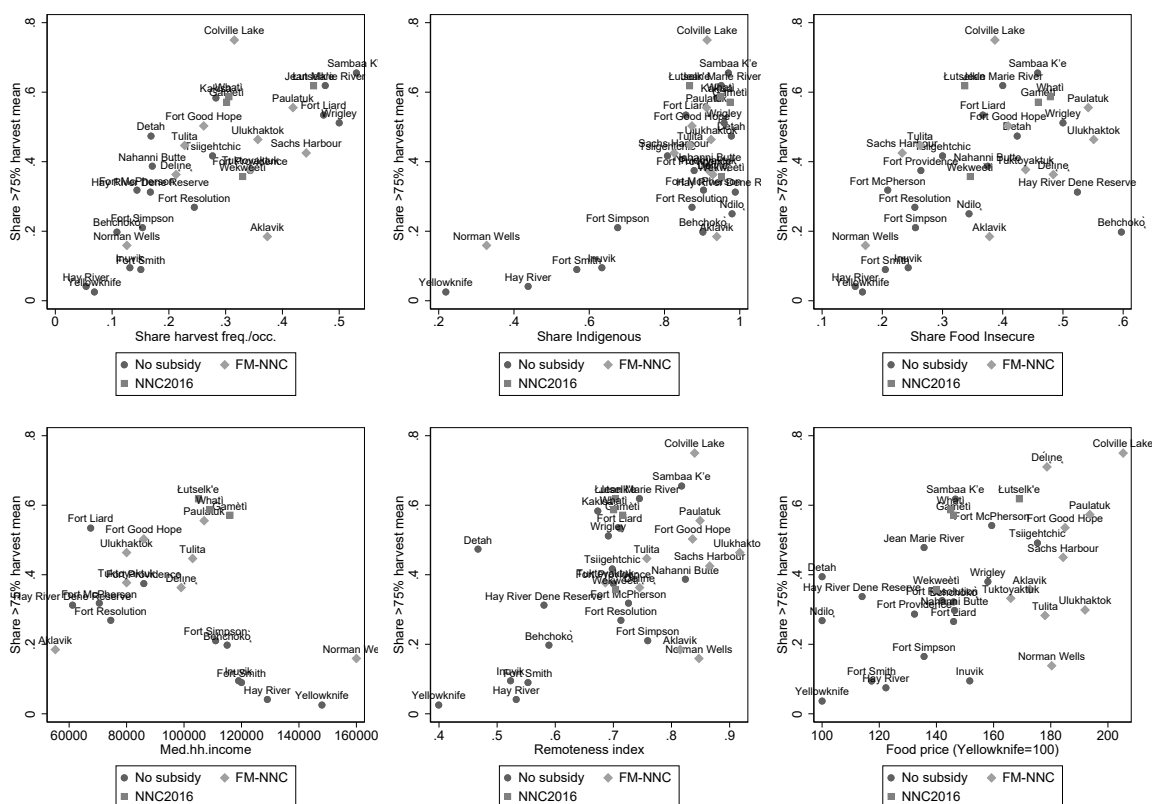


Figure 2: Correlates of the share of households that consume 75% or more of meat/fish from hunting/fishing in the NWT Community Survey in 2018. All data come from the 2018 NWT community survey except remoteness index (from Statistics Canada) and Food Price Index (from the NWT Community Price Survey in 2019, with Yellowknife=100).

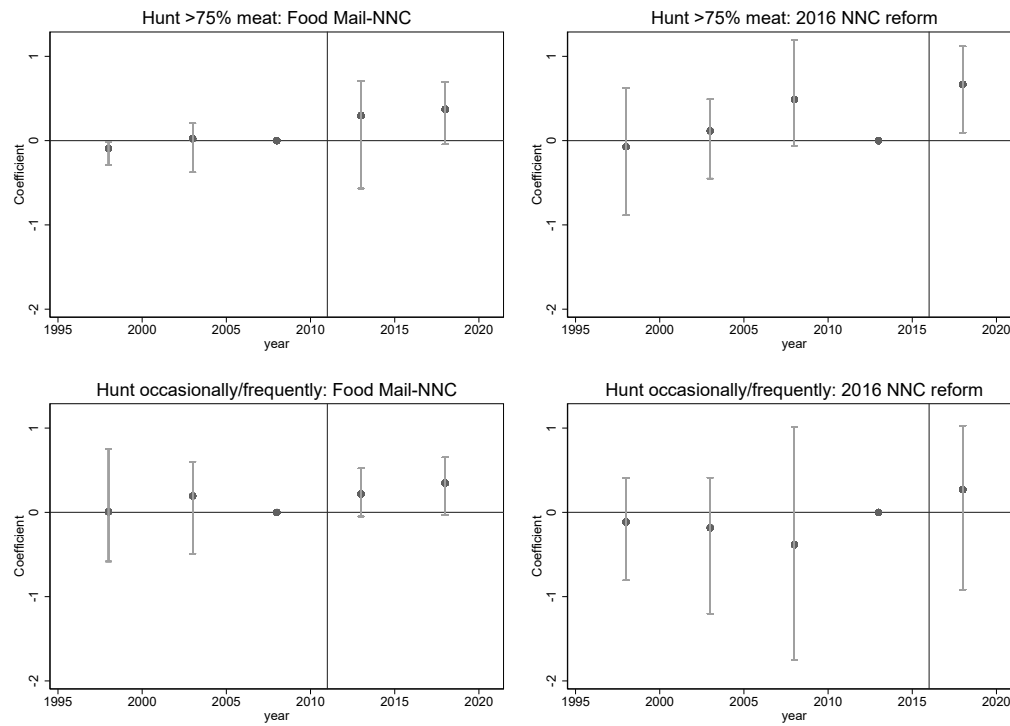


Figure 3: Period-by-period estimates for each NNC transition with 95% (wild cluster bootstrapped) confidence intervals. Omitted category is 2008 (for FM to NNC transition) and 2013 (for 2016 eligibility expansion). See text for description of regression; all estimates include region-time fixed effects and community fixed effects, with standard errors clustered by community.

Table 1: Summary statistics for main controls and outcomes, by NNC treatment group

NNC Group (communities)	Never eligible (20)					FM to NNC 2011-2012 (10)					Full subsidy in 2016 (4)				
	1998	2003	2008	2013	2018	1998	2003	2008	2013	2018	1998	2003	2008	2013	2018
Households	567	599	634	645	646	168	166	163	160	160	78	90	84	84	84
Ind. Age 15 up	1315	1410	1520	1532	1591	366	357	396	403	386	214	245	225	236	242
Remoteness Index	0.65	0.65	0.65	0.65	0.65	0.82	0.82	0.82	0.82	0.82	0.71	0.71	0.71	0.71	0.71
Indigenous share			0.79	0.80	0.79			0.82	0.83	0.84		0.94	0.94	0.93	0.94
Median hh income	47723	61136	74490	79590	100155	39885	48032	64216	75750	96275	47488	39964	60664	74197	110000
Share food insecure	0.33	0.33	0.33	0.33	0.33	0.39	0.39	0.39	0.39	0.39	0.41	0.41	0.41	0.41	0.41
Share >75% country food	0.38	0.38	0.36	0.30	0.33	0.52	0.45	0.43	0.44	0.42	0.66	0.57	0.67	0.46	0.53
Share > 0 country food		0.87	0.89	0.85	0.84		0.92	0.94	0.90	0.90		0.99	0.94	0.94	0.94
Agg. share country food		0.53	0.55	0.50	0.49		0.61	0.62	0.61	0.59		0.71	0.73	0.66	0.66
Share hunt frequently/occ.	0.17	0.18	0.22	0.27	0.24	0.24	0.23	0.28	0.39	0.31	0.31	0.20	0.28	0.39	0.35
Share hunt	0.41	0.46	0.44	0.55	0.47	0.54	0.56	0.56	0.62	0.57	0.63	0.56	0.53	0.66	0.65
Indig. share hunt			0.46	0.58	0.49			0.58	0.66	0.59			0.55	0.66	0.67
Non-indig. share hunt			0.38	0.47	0.29			0.43	0.40	0.40			0.38	0.51	0.48
Agg. share hunt	0.10	0.12	0.12	0.16	0.15	0.14	0.13	0.17	0.20	0.20	0.18	0.14	0.17	0.20	0.23
Share trap	0.15	0.17	0.16	0.15	0.13	0.13	0.13	0.15	0.13	0.12	0.20	0.17	0.21	0.16	0.25
Year	2000	2004	2010	2015	2019	2000	2004	2010	2015	2019	2000	2004	2010	2015	2019
Food price index	131	133	128	134	140	180	194	183	174	177	157	159	149	145	150

All data come from the NWT community surveys conducted in 1998, 2003, 2008, 2013, 2018 except for the remoteness index (from Statistics Canada) and Food Price Index (from the NWT Community Price Survey years, Yellowknife=100).

Table 2: Effects of Nutrition North transitions on country food consumption

	(1)	(2)	(3)	(4)	(5)
Year FE	Yes	No	No	No	No
Year-Region FE	No	Yes	Yes	Yes	Yes
Panel A: Dependent var. is ln(share of hh with >75% meat from hunting/fishing)					
FM-NNC transition	0.237***	0.357*	0.357*	0.363*	0.303
95% CI	(0.102, 0.370)	(-0.040, 0.619)	(-0.059, 0.672)	(-0.099, 0.685)	(-0.282, 0.607)
NNC2016 transition	0.443	0.529*	0.538*	0.654*	0.426**
95% CI	(-0.594, 1.061)	(-0.338, 0.844)	(-0.306, 0.844)	(-0.060, 1.540)	(0.029, 0.703)
Log(med.hh.inc.)				-0.194	
95% CI				(-0.696, 0.460)	
Indig. share					0.271
95% CI					(-2.035, 2.629)
Observations	160	160	137	106	98
Adj R-squared	0.965	0.981	0.945	0.939	0.981
Communities	33	33	28	24	33
Panel B: Dependent var. is ln(share of hh with >0% meat from hunting/fishing)					
FM-NNC transition	0.045	0.103*	0.103*	0.114*	0.110*
95% CI	(-0.049, 0.126)	(-0.042, 0.163)	(-0.057, 0.168)	(-0.058, 0.190)	(-0.044, 0.230)
NNC2016 transition	0.075	0.062*	0.061*	0.073*	0.074
95% CI	(-0.155, 0.282)	(-0.125, 0.145)	(-0.094, 0.145)	(-0.054, 0.290)	(-0.190, 0.201)
Log(med.hh.inc.)				-0.030	
95% CI				(-0.135, 0.086)	
Indig. share					-0.212
95% CI					(-0.585, 0.219)
Observations	132	132	116	88	99
Adj R-squared	0.958	0.987	0.942	0.939	0.988
Communities	33	33	29	25	33
Panel C: Dependent var. is ln(aggregate community meat share from hunting/fishing)					
FM-NNC transition	0.302*	0.119*	0.119*	0.131*	0.112*
95% CI	(-0.015, 0.637)	(-0.048, 0.200)	(-0.021, 0.201)	(-0.016, 0.242)	(-0.063, 0.184)
NNC2016 transition	0.284	0.214*	0.217	0.250	0.222
95% CI	(-0.489, 1.018)	(-0.402, 0.450)	(-0.386, 0.451)	(-0.186, 1.302)	(-0.395, 0.519)
Log(med.hh.inc.)				-0.040	
95% CI				(-0.314, 0.262)	
Indig. share					-0.208
95% CI					(-0.899, 0.478)
Observations	132	132	116	88	99
Adj R-squared	0.907	0.990	0.980	0.978	0.990
Communities	33	33	29	25	33

P-values and confidence intervals are based on a wild cluster boot-strap with Webb weights (clustered by community). *** p<0.01, ** p<0.05, * p<0.10. All regressions include community fixed effects and log number of households and are weighted by the number of households. Data come from the Northwest Territories Community Surveys from 1998, 2003, 2008, 2013, and 2018.

Table 3: Effects of Nutrition North transitions on country food collection/production

	(1)	(2)	(3)	(4)	(5)
Year FE	Yes	No	No	No	No
Year-Region FE	No	Yes	Yes	Yes	Yes
Panel A: Dependent var. is ln(share of persons 15 and up hunting/fishing frequently/occasionally(more than day trips))					
FM-NNC transition	0.164**	0.216**	0.216**	0.208**	0.237**
95% CI	(0.026, 0.347)	(0.066, 0.413)	(0.059, 0.421)	(0.020, 0.490)	(0.012, 0.406)
NNC2016 transition	0.501*	0.436*	0.438*	0.397**	0.435**
95% CI	(-0.249, 1.159)	(-0.262, 0.815)	(-0.387, 0.882)	(0.190, 0.990)	(-0.228, 0.907)
Log(med.hh.inc.)				0.232	
95% CI				(-0.474, 0.905)	
Indig. share					2.064**
95% CI					(0.476, 3.327)
Observations	165	165	145	114	99
Adj R-squared	0.861	0.892	0.801	0.883	0.902
Communities	33	33	29	27	33
Panel B: Dependent var. is ln(share of persons 15 and up hunting/fishing in last year)					
FM-NNC transition	0.041	0.057	0.058	0.067	0.038
95% CI	(-0.136, 0.211)	(-0.043, 0.163)	(-0.053, 0.168)	(-0.028, 0.173)	(-0.230, 0.227)
NNC2016 transition	0.290	0.287	0.286	0.296	0.386*
95% CI	(-0.434, 1.425)	(-0.379, 0.610)	(-0.426, 0.614)	(-0.206, 2.119)	(-0.354, 0.685)
Log(med.hh.inc.)				0.082	
95% CI				(-0.382, 0.580)	
Indig. share					1.829**
95% CI					(0.174, 3.800)
Observations	165	165	145	114	99
Adj R-squared	0.749	0.844	0.749	0.830	0.906
Communities	33	33	29	27	33
Panel C: Dependent var. is ln(aggregate community hunting/fishing frequency)					
FM-NNC transition	0.179***	0.186**	0.186**	0.152*	0.069
95% CI	(0.058, 0.321)	(0.057, 0.355)	(0.051, 0.342)	(-0.032, 0.398)	(-0.067, 0.159)
NNC2016 transition	0.477	0.315*	0.317*	0.232	0.439*
95% CI	(-0.157, 1.202)	(-0.188, 0.728)	(-0.138, 0.628)	(-0.046, 0.572)	(-0.064, 1.063)
Log(med.hh.inc.)				0.402	
95% CI				(-0.206, 0.996)	
Indig. share					1.768**
95% CI					(0.162, 3.196)
Observations	165	165	145	114	99
Adj R-squared	0.865	0.892	0.782	0.881	0.914
Communities	33	33	29	27	33

P-values and confidence intervals are based on a wild cluster boot-strap with Webb weights (clustered by community). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. All regressions include community fixed effects and log number of persons aged 15 and up and are weighted by the number of persons aged 15 and up. Data come from the Northwest Territories Community Surveys from 1998, 2003, 2008, 2013, and 2018.

Table 4: Effects of Nutrition North transitions on trapping and on hunting/fishing (by Indigenous status)

Dependent variable	Log(share trapping)	asinh(share of Indig. hunting)	asinh(share non-Indig. hunting)
FM-NNC transition	0.149	0.034	-0.003
95% CI	(-0.195, 0.334)	(-0.019, 0.142)	(-0.388, 0.102)
NNC2016 transition	0.660	0.157*	0.147
95% CI	(-1.212, 1.959)	(-0.056, 0.295)	(-0.623, 0.575)
Observations	158	99	99
Adj R-squared	0.964	0.850	0.564
Communities	33	33	33

P-values and confidence intervals are based on a wild cluster boot-strap with Webb weights (clustered by community). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. All regressions include community fixed effects and log number of adults aged 15 and up and weighted by the number of households aged 15 and up (by Indigenous status in columns 2 and 3). We use the inverse hyperbolic sine function for columns 2 and 3 to deal with zero values for six non-Indigenous community-year cells (rather than dropping observations) but estimates are similar with logs. Data come from the Northwest Territories Community Surveys from 1998, 2003, 2008, 2013, and 2018 (1998 and 2003 excluded for columns 2 and 3).

Table 5: Effects of Nutrition North transitions on food prices.

Dependent variable	(1) Price	(2) ln(price)	(3) Price	(4) ln(price)
Panel A: NWT Food Price Index (Yellowknife=100)				
FM-NNC transition	-16.947***	-0.100***	-26.000***	-0.148**
95% CI	(-25.119, -8.283)	(-0.150, -0.049)	(-40.914, -3.047)	(-0.234, -0.007)
NNC2016 transition	-6.474	-0.040	-10.113	-0.070
95% CI	(-23.779, 10.761)	(-0.149, 0.079)	(-33.989, 16.316)	(-0.211, 0.099)
NNC2019 subsidy	-2.090	-0.020	2.833	0.014
95% CI	(-12.507, 8.294)	(-0.082, 0.043)	(-14.976, 23.887)	(-0.093, 0.131)
Community FE	Yes	Yes	Yes	Yes
Time FE	Year	Year	Year-region	Year-region
Observations	128	128	128	128
Communities	32	32	32	32
Adj R-squared	0.909	0.924	0.905	0.924
Panel B: Revised Northern Food Basket (RNFB) in \$, all Canada				
FM-NNC transition	-17.063***	-0.039***	-11.817*	-0.028**
95% CI	(-27.497, -6.459)	(-0.095, -0.053)	(-41.207, -4.802)	(-0.057, -0.001)
NNC2016 transition	-30.370***	-0.074***	-25.164**	-0.060**
95% CI	(-38.593, -22.406)	(-0.064, -0.013)	(-23.504, 0.271)	(-0.098, -0.011)
Community FE	Yes	Yes	Yes	Yes
Time FE	Quarter	Quarter	Quarter-province	Quarter-province
Observations	2,591	2,591	2,454	2,454
Communities	88	88	88	88
Adj R-squared	0.793	0.800	0.858	0.866

P-values and confidence intervals are based on a wild cluster boot-strap with Webb weights (clustered by community). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Panel A uses data for the 32 communities in the NWT Community Price Surveys for 2004, 2010, 2015 and 2019 (2012 is dropped), where prices are expressed relative to Yellowknife=100. We include an indicator for communities that received a subsidy increase in Jan. 2019, which includes all FM-NNC transition and NNC2016 communities except for Tuktoyaktuk (which lost eligibility in April 2018 due to road construction). Panel B uses data on RNFB costs from the Nutrition North Canada and Food Mail websites (current and historical/archived versions) for 88 communities between 2005 and 2018, expressed in current dollars. Data from before 2011 are annual and collected at different months (we assume a common month of March) and data from 2011 onwards are collected on a quarterly (March, June, September, December) basis, with the FM-NNC subsidy transition taking place in April 2011 (just after the March 2011 prices are reported) and the NNC2016 transition taking place in October 2016 (so the first quarter coded with a dummy is December 2016).

Table 6: Effects of 2016 Nutrition North Canada transition on subsidy value and quantity of subsidized shipments, per capita (2012-2018).

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent var.	Sub. value	Meat sub. val.	Weight	Meat weight	ln(Weight)	ln(Meat weight)
Panel A: NWT communities only: 11 total, 1 treated						
NNC2016 transition	664.177	91.938	31.218	2.488	0.124	0.067
95% CI	(-383, 1930)	(-46, 226)	(-234, 337)	(-46, 47)	(-0.903, 1.287)	(-1.021, 1.121)
Community FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	71	71	71	71	71	71
Adj R-squared	0.961	0.976	0.868	0.856	0.858	0.835
Panel B: All communities: 85 total, 8 treated						
NNC2016 transition	361.958***	56.929***	57.718***	6.753***	0.245***	0.189***
95% CI	(216, 528)	(35, 80)	(30, 91)	(2, 11)	(0.141, 0.358)	(0.076, 0.312)
Community FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	544	544	544	544	544	544
Adj R-squared	0.971	0.967	0.920	0.886	0.915	0.879

P-values and confidence intervals are based on a wild cluster boot-strap with Webb weights (clustered by community). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Subsidy and weight per community/year come from the Nutrition North Canada website, with population from the 2016 Census. We restrict the sample to community/year cells with at least 100KG of subsidized food shipped per capita. NNC2016 transition is coded as 0 before the year 2016, 0.25 for the year 2016 and 1 thereafter.