Chapter 1

Food Energy and the Expansion of the Canadian Fur Trade

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Introduction

As a recent global history of eating and feasting has pointed out, “historians are newcomers to the study of food.”¹ Although historians have engaged in questions of diet and nutrition, recently exploring the centrality of food in its social and cultural contexts in “edible histories” of Canada, historians have generally overlooked the particular ways that carbohydrates, fats and proteins actually combusted at a molecular level to drive colonialism, form linkages between rural landscapes and aboriginal territories, or fuel a brawny environmental overreach in Canada’s staple resource economies.² But however invisible to

¹ Diane Kirkby and Tanja Luckins, eds., Dining on Turtles: Food Feasts and Drinking in History (Houndmills, Basinstoke: Palgrave Macmillan, 2007) 3-4.
historians, food has been the foundation of much of the energy and power in Canada. In pre-industrial settings, food energy animated muscle power. Much of the work in back-country farming, logging, fishing and proto-industry was powered in the hoppy conviviality of countryside taverns, the fatty tortières of Lower Canada, or even the seasonal clockwork of binge religious feasting. Bursts of caloric energy, in periods of better food production or purchasing power, arguably provided catalysts for historical economic and social change. Food is an energy fact of life, and the history of energy and power in Canada requires its own food energy tally.

The “calorie” unit, invented in the nineteenth century to measure the potential energy of food, seems especially relevant in Canada given the preponderance and grinding nature of the endosomatic (or human-powered) energy regime dominating much of its earlier past. This chapter will argue that in the case of that quintessentially Canadian endeavour, the fur trade, food energy was probably the driver of newcomer and First Nations’ relations, unsustainable fur production, and, ultimately, rapid commercial expansion. Food energy in the fur trade changed at critical moments, offering higher orders of potential labour productivity. Indeed, if Harold Innis


3 Vernon, Hunger: A Modern History, 84-86; Alain Drouard, “Reforming Diet at the End of the Nineteenth Century in Europe,” in, Peter Lumnel Atkins and Derek J. Peter Oddy, eds. Food and the City in Europe Since 1800 (Abingdon: Ashgate Publishing Group, 2008) 216.
4 The expression is J.R. McNeill’s, described in Something New Under the Sun: An Environmental History of the Twentieth Century World (New York: W.W. Norton & Co., 2000) 11.
saw transportation innovations and the opportunities of Canadian shield river systems allowing
for the trade’s geographic expansion – a mainstay of his classic “staples” thesis -- it was surely
food energy that provided a motive force for the national story arc he saw arising from it.\(^5\) This
chapter suggests that the Canadian fur trade, centred around a caloric-poor subarctic prime
furbearer habitat, expanded at a key moment when a new food energy regime, based on bison fat,
allowed St. Lawrence valley and Hudson Bay fur traders to manifestly extend their extractive
activities across far larger spaces, indeed across the continent.

*The Old Food Regime of the Canadian Fur Trade*

That energy shift took place deep in the interior of North America. In the swaying tall
grass prairie of present day southern Manitoba, in 1793, fur trader Duncan M’Gillivray took note
of no less than 21 trading posts busily operating in the Qu’Appelle, Assiniboine and Red River
valleys, alone.\(^6\) Their major trading item was not fur, but food. Companies around him in the
North Saskatchewan basin, too, were shifting fur trader diets into the high caloric energy offered
in bison flesh and fat. So frantic was food purchasing that these prairie outposts could seem more
like abattoirs than commercial way stations. Rafters hung with hundreds, even thousands, of
drying tongues. Cauldrons of flammable, occasionally exploding, tallow fats littered courtyards.
Blood-soaked timbers lined meat sheds. As M’Gillivray observed, the fur trade’s very success
now hinged on the uninterrupted supply of plains foods, and within them, critical bioenergy for

\(^5\) Harold Adams Innis, *The Fur Trade in Canada* (Toronto: University of Toronto Press, 1999
[1930]) 383-402.

\(^6\) Arthur S. Morton, ed. *The Journal of Duncan M’Gillivray of the North West Company at Fort
George on the Saskatchewan, 1794-5* (Toronto: Macmillan Co. of Canada, 1929) 58. Robert
Goodwin Letter to Charles Isham, 6 February 1795, Brandon house Journals, B.22/a/1.
work. If the bison hunt was stopped, it “would prevent progress & stop the Trade,” he said. “It is wisely ordered by Providence that this should be so.”

Just prior to M’Gillivray making these observations, the fur trade had reached its absolute geographic limits. Certainly by the 1770s, company men dependent on corn carbohydrates to muscle their canoe voyaging, were quite simply running out of fuel. Travelling by canoe from the St. Lawrence, fur traders, and their Hudson’s Bay Company rivals from James and Hudson Bay, began to starve in the difficult transits across the Rainy Lakes- Lake Winnipeg corridor or the uplands of the Canadian Shield. Given that most of the fur trade sprawled across the subarctic, an ecological biome with one of the lowest carrying capacities in North America, the fur trade from the start depended on food carried by brigades, not traded from dispersed and small populations of boreal hunting and gathering people. In the next decades, Europeans who would have otherwise starved, harnessed a revolutionary new bioenergy source in bison fat. Offered in the form of pemmican, this food source proved far more effective and converted to unheard of quantities of energy to be released in the heavy labour driving fur trade brigades and York boat crews.

The reason why food energy was so critical to the fur trade was the comparatively lower returns on labour made in canoes and other water craft used to move commodities and traders. Canoe design borrowed from Algonquian allies in New France was admirably suited to subarctic travel. However, it lent itself to none of the technological innovations of the modern age, except

that the French, for commercial purposes, were able to enlarge Algonquian canoes and further organize labour in brigades to race time coming and going from their ever-larger trading hinterlands. These limits were not uncommon in pre-industrial settings where relatively small inputs of water and wind power meant that human muscle fiber accounted for up to 70% of all the mechanical energy transforming the environment - perhaps 80% if plant and animal energy inputs are also considered.10

But unlike farm economies freed up by breakthroughs in labour saving devices (the cradle scythe, the fanning mill or the first seed drills drawn by horse, to name a few), 11 the expanding fur trade reached relatively early the limits of its potential work efficiency. Carolyn Podruchny has described the almost inconceivably difficult human effort to drive the fur trade, one giving rise to a distinctive and “manly” voyageur culture. 12 As Claiborne Skinner simply observed, men employed driving canoes “did physically brutal work in an absurdly long work day.”13 Certainly, the human manpower driving the fur trade staggered the imagination of contemporaries. A late eighteenth century traveler viewing the fur trade described it frankly: “No men in the world are more severely worked than are these Canadian voyageurs. I have known them to work in a canoe twenty hours out of twenty-four, and go on at that rate during a fortnight

10 Graeme Wynn, Canada and Arctic North America: An Environmental History (Santa Barbara: ABC-Clio, 2007) 113.
or three weeks without a day of rest or any diminution of labour.” He added, significantly, that “they lose much flesh in the performance of such journies [sic], though the quantity of food they consume is incredible.”

Two environmental realities conspired against the fur trade’s expansion. The Canadian Shield, although appearing flat, proved a long-distance canoeist’s nightmare. It was shaped like a great Precambrian granite saucer, with its centre in the middle of Hudson Bay. Shield rivers flushed seasonally down the “rock” or “upland” roil areas along its rim, and then slowed into flattened lowland stretches. Montreal companies tended to stay high “along the rim” of the shield and use the concentric circles of river routes that followed on or around it, to only occasionally cut across water basin portage points. The Hudson’s Bay Company, unfortunately located at the bottom of the shield, had to literally climb rivers. Its traders ascended the Hays, Nelson, Albany, and other Shield rivers on foot, dragging watercraft behind them. Most brigades timed their journeys across the Shield to periods when river draw-down occurred in the later summer and avoided them completely in the spring flush. Wind-battered sections of lakes, baldly exposed big-current rivers and reed-tangled marshes were avoided completely. The other problem was biotic: the shield sprawls across the large transcontinental sweep of the subarctic biome, where horticulture was largely nonexistent, big game easily hunted out, and aboriginal populations sparse. For that reason, fur companies constantly reconnoitered new routes, bettered seasonal ascents, and quickened their return voyages in order to economize as best as they could very finite food supplies.

14 Podruchny, Making the Voyageur World, 88.
Even finessing and enlarging Algonquian canoe technology to the needs of commerce in the seventeenth century did not give impressive returns on scale. The Montreal cargo canoes emerging in the 1680s were intentionally supersized, but still ungainly and limited to deep water routes. These *canots du maître* plied the St. Lawrence-Great Lakes corridor with crews numbering as few as six but often as many as twelve, and averaging eight to ten; these craft could carry up to 8000lbs. Larger canoes by the mid-18th century allowed for the 50lb *pièce* to be packed in 100lb packs, 60 of which could be hauled in these larger canoes, along with 1000lb of provisions.\(^{16}\) When companies spread farther inland on the Shield or into the smaller, more difficult waters of the Hudson Bay watersheds, the “north west canoe” was adopted: smaller, carrying about two tons of cargo, perhaps 25 feet in length, and manned by an average of five or six men. Even paddling in unison, and well disciplined by emergent voyageur traditions – syncopating their paddling to the songs they sung; regular rests about on the hour to have smoke breaks; and ritualized rewards of brandy after extraordinarily difficult portages and dangerous rapids – the canoe frontier reached the outer limits of its productivity and geographic extent by the mid eighteenth century.\(^{17}\)

One insurmountable problem of the canoe frontier was the stout and relatively strong narrow-bladed paddle almost universally used by voyageurs. Snout-nosed and blunt to withstand shocks on rock, the voyageur paddle did not displace a great deal of water and paddlers had to use a short stroke of 40 counts a minute to gain any speed.\(^{18}\) Given the staggering dead weight of a Montreal canoe in water – well over 4 tons – and the fact that these craft did not glide well,

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voyageurs paddled almost constantly to keep a canoe in motion. Meanwhile, the relatively short season in northern Canadian latitudes and need to cover sometimes thousands of miles before ice-up forced voyageurs to work almost ceaselessly, 12 to 14 hour days typically. Men, then, would launch canoes often by 4:00 am and put up them up at 9:00 or 10:00 pm, or with the sun’s final setting. In lake country, the working shifts lengthened considerably because ideal voyaging occurred at night, when the wind fell and trips became safer on open water. In such circumstances, either to make up for lost time or to speed up the journey, voyageurs paddled throughout the night, and 24-hour voyaging was not uncommon, especially through the dangerous traverses of the Great Lakes.\textsuperscript{19}

French fur traders learned from First Nations to smoke tobacco as an appetite suppressant,\textsuperscript{20} but their work ultimately produced significant caloric deficits. The common estimate is that voyageurs burnt between 4000 to 6000 calories a day.\textsuperscript{21} Unlike the images from 1920s silent movies showing strapping and muscular French Canadian voyageurs, these chronically underfed and overworked labourers were likely seriously underweight and debilitated by personal injuries, bone deformities and stressed constitutions.\textsuperscript{22} A better image of voyageurs is hinted in modern day trans-Atlantic rowing competitions. Despite consuming up to 8000 calories a day (65\% carbohydrate; 10\% protein and 25\% fat), paddlers still suffer daily calorie

\textsuperscript{19} Podrychny, 114-118.
\textsuperscript{20} Skinner 224-227.
\textsuperscript{21} Morse rates the calories as 4000 to 5000, without attribution, p. 24. Skinner counts 4 to 6000 calories, without attribution, 59.
deficits ranging from 1200 to 1500 kcal; in one case, these super-athletes on average shed between 20 and 25lbs in 58 days of intensive rowing.23

The voyageur’s diet in the St. Lawrence-Great Lakes corridor was limited in a number of other ways. Since the shield areas did not provide much food en route, their brigades took on agricultural supplies back in New France or at the corn-growing centres around Detroit and the southeastern marsh-tracts of the Great Lakes. The “custom of the voyageur,” a phrase likely borrowed from unwritten customary law traditions,24 was pretty meager, however: it consisted of leached corn (Indian corn first dried out and boiled before eating to allow its sugars to be better digested), and/or dried peas, and a portion of fat in the form of lard (the Montreal men going to Grand Portage, hence, were called the “lard” or “pork” eaters for that reason).25 Corn supplies from the St. Lawrence corridor, however, quickly ran out en route. Supplies later derived from Detroit were prohibitively expensive; as were tallow pork fats available to voyageur crews from that location.26 The cargo of a 3-man canoe in 1694 heading for Illinois Country was likely typical, its voyageurs consuming more carbohydrates than fats and very little protein. Their diet was made of a biscuit to grease ratio of 6:1. For their entire voyage, a man had 40lb biscuit and 7lb of grease. He also had 3 gallons of dried peas.27 From a caloric point of view, these outfits were woefully under-stocked. The diets of men going on to Detroit in the same period were

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25 Grace Lee Nute, *Voyageur* (Minnesota Historical Society, 1987)
much the same: 100lb biscuit and 25lb lard per man.²⁸ How this might have been improved, even if there was not such limits on cargo space, is not certain. Skinner’s estimate of the livre cost of even a late seventeenth century 3-man canoe suggests that food already constituted the greatest expenditure for the outfit: some 55% of total expenses, in fact.²⁹

Given the poor carrying capacity of the subarctic, it became a gruesome truism of the trade that the farther the destination, the greater the difficulty in feeding the men going there. Le Sieur de La Véréndrye, who perhaps moved the fur trade the farthest in the early eighteenth century, left Montreal in 1731 to reach Kaminisquia, the farthest point on the other side of Lake Superior after 79 days, to cover about 1100 miles.³⁰ Later, outbound voyages, first to Rainy Lakes, then Lakes of the Woods and finally, Lake Winnipeg, took 104 days, and were slowed considerably by the deteriorating conditions late in the season. In such extremities of the French fur trading empire, traders searched for Ojibwa and Cree to trade meats, fats and wild rice. The only and very uncertain supply to be added beyond Lake Superior and the Grand Portage, however, were high-starch wild rice stocks harvested by Ojibwa near Lake of the Woods. In the case of Alexander Henry the Elder, a relatively short voyage for 12 of his men between Michilimackinac and the end point of Lake Superior in the mid-1770s, of a about a month, required 50 bushels of corn. The ration of just over 4 bushels/ man would have given about 230lb

²⁸ Skinner 109
²⁹ See table, Skinner, 61.
³⁰ Skinner 219
of corn for each. A generous estimate would give each voyageur, then, about 7lb of corn a day, or about 3680 calories, likely well below their own energy needs.  

The human body consumed food energy in a variety of ways in the course of a voyageur’s travels. Transforming energy into work required the release and combustion of Adenosine triphosphate (ATP), which is broken down into chemical energy for muscle contraction. In the fur trade, combinations of muscular contraction dominated work: short term anaerobic systems provided energy for short bursts of effort for sudden, short-duration exertions – to respond, for instance, to the sudden, temperamental changes in a river’s currents and velocity, to wild rapids that imperiled life and limb, and, of course, to the portage. With a 100lb pièce suspended on one’s back by tumpline, men would portage in adrenaline-hopped half-mile runs, doubled over. This ATP energy, however, came with a cost. Anaerobic metabolism left a residue of lactate acid that built up and quickly debilitated an individual doing such maximal exercise. James Sutherland clearly reached this maximal muscle exertion when he travelled with Ojibwa over a 56-day period across shield country. On one day paddling and carrying a canoe over a 19-hour stretch, he confessed in his journal that night to being “very unhappy” and “not able to lift my arms.”

Greater food energy was more typically released from aerobic metabolism where ATP was created through the burning of glucose. Oxidative systems, sustaining the greatest part of the voyageur’s work day of monotonous but tiring paddling, importantly, took energy from fats and

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31 Henry, Travels and Adventures 184.
carbohydrates to create comparatively vast amounts of ATP. Most paddling, at 40 strokes a minute, would have constituted medium-exertion exercise in which this form of muscle energy was released.

Whatever way they metabolized energy, voyageurs rapidly consumed whatever food they could carry inland. They came up against the absolute caloric limits of the canoe frontier as early as the 1770s. After the conquest of New France, British capital prompted the movement of many more Europeans inland, from 1500 to 2000 miles from Montreal. Starvation awaited many traders upon entering the Lake Winnipeg region and the distant Athabasca drainage. In 1775, Peter Pond and Alexander Henry “barely reached their wintering place” across Lake Winnipeg; their 100 men in 20 canoes came very close to starving to death en route, and they lived miserably on fish during the winter, their corn and wild rice long before exhausted. Another Montreal trader, Thomas Frobisher, led crews that almost starved crossing Lake Winnipeg, and also ended up subsisting only on fish in their push to distant Île-à-la Crosse.

33 16 June 1785, James Sutherland Journal, Gloucester House, B.78/a/15.
34 Innis well anticipated this crisis, in his description of the strategies of Peter Pond and his partners sharing food to get him into the Athabasca district. Harold Innis, The Fur Trade in Canada, 93-111.
Figure 1: Major fur trade posts in Western Canada, 1780-1821; the boreal forest, part of the subarctic biome, had little food to offer travelling voyageurs. The grasslands, offering plains bison herds, in yellow, and parkland areas, in light green, became the breadbasket region for pemmican production to support the Canadian fur trade. Map by author.

In the 1770s, fur trade journals more commonly reported cases of exhaustion, hunger, starvation, and even cannibalism in the farther extremes of the Canadian Shield.\(^36\) Even if they arrived to their wintering camps, traders faced worst conditions during the cold season when food supply virtually ended altogether. Benjamin Frobisher in 1775 admitted to his HBC rivals the “great Destress he ware in for Provisions, which ware realy shocking” in what became
known as the English River district, just north and east of Lake Winnipeg. One or two of Frobisher’s men starved to death during the winter, one had apparently resorted to cannibalism, and Frobisher himself had survived only by eating the post’s moose skins and many of the furs traded from Indians — “and even a few garden seeds” imported from Canada. By the time traders in a last gasp reached Lake Winnipeg, swatting mosquitoes and cursing blackflies, food figured as their greatest concern. Europeans learned in a hurry how to fish the vast but capricious waters of the lake, but winter hunting in forests nearby was always difficult, or game populations easily exhausted.

New Food, new Energy

It was fortunate that, immediately after their arrival in Athabasca territory, Montreal traders made a critical discovery in native food production and transferred it to their business operations. In the 1770s they made a critical leap of harnessing pemmican energy — a combination of dried, pounded meat, joined with melted fat in almost equal ratios, sewn in bags. In so doing, they decisively shifted diets from their carbohydrate base on one side of the Grand Portage, on the east side of Lake Superior, to one of protein and fat on the other.

37 *Journals of Samuel Hearne and Philip Turnor Between the Years 1774 and 1792*, ed. J.B. Tyrrell, (Toronto: Champlain Society, 1934), 190.
38 The poor winter conditions are best illustrated in B.254/a/1, Blood River Journal 1794-95.
Already by the 1780s, local Chipewyan, Cree and Beaver were providing supplies of bison, elk and deer during the winter to these newcomers in the North. Europeans systematically converged Dene fats and dried meat of wood bison (*Bison bison athabascae*), converted to pemmican, to the portal of the La Loche carrying place for incoming crews. They, in effect, joined northern winter pemmican to the needs of crews going on to the nascent post system on the Athabasca, Slave and Mackenzie Rivers. At Fort Chipewyan, Alexander Mackenzie coordinated the first relay system between camps of Beaver and Cree by 1788, when he sent “provisions for the canoes in their voyage out in the Spring.” A few years later, a single canoe pllying the Peace River would collect about two tons of dried meat for that purpose.42

The true take-off occurred as fur companies began developing a longer distance food system where they could feed the fur trade in the barren grounds on pemmican produced far to the southward in the parkland and the plains. There plains bison herds (*Bison bison bison*) roamed in seemingly limitless numbers. In 1775, the Montreal trader, Alexander Henry the Elder, noted the quantities of food already being traded by the plains Assiniboine to Nor’westers for the new purpose.43 (See figure 1) Indeed, Montreal companies were deriving by the mid-1780s so much pemmican that they could trade it cheaply to boreal forest people who, in turn, used it to visit farther areas of the Canadian Shield to trade. John Sutherland, travelling through north central Ontario in an Ojibwa brigade in 1785 noted that the 12 Ojibwa he accompanied, led by Newitchcanism, were using buffalo pemmican to make almost marathon-like passages by

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40 See my references to fur traders using the term “custom of the country,” in my *Game in the Garden*, 36-37.
canoe over the Shield from their visit to HBC posts. Instead of stopping and cooking to eat, they had a little fat “which they mix with Ruahaggan [a form of buffalo pemmican] and eat while they paddle.” They canoed through the daylight hours without pause, their fuel source “Buffalo Rucheggan mixed with fat.” Sutherland expressed in wonder: “what may seem surprising they traded most of it from the [Montreal] pedlers who has more of it than they can use, as the fire [or plains] country through which they pass is so plentiful of that kind of provision,” he said.

Sutherland was witnessing a significant shift in food energy driving the fur trade both on the plains and, now, the boreal forest. The numbers speak for themselves: a single pound of pemmican might have contained as much as 3200-3500 calories per pound. What became the standard bag of the stuff, weighing 90lbs, likely had the caloric value of between 288,000 and 315,000 kilocalories. That almost doubled the food energy value of dried corn or wild rice. According to Alexander Mackenzie, who was a pemmican-eater, the “custom of the voyageur,” offered “wholesome, palatable food, and easy of digestion... sufficient for a man’s subsistence during twenty-four hours,” but he pointed out that “it is not sufficiently heartening to sustain the strength necessary for a state of active labour.” At most, the custom offered 510 calories from the lard, and the 1.43lbs weight in corn, another 2676, for a total of 3186. But that was still far below the needs of a man burning 4,000 to 6,000 calories a day. If a Montreal canoe usually carrying 1000lb of provisions was carrying corn, it might have availed about 300 man-days of energy, in an eight-man canoe, perhaps 38 days of actual journeying. If they were fortunate to take on, like Alexander Henry the Younger did, 100 bags of wild rice, in Lake of the Woods, (at

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44 12-17 June 1785, Gloucester House Journal, B.78/a/15.
about 1619 cal/lb), the same canoe could carry energy for a further 33 days. By contrast, a Montreal canoe hypothetically carrying 1000lb of pemmican would have food energy of about 533 man-days, or almost 67 days of journeying, almost double that of corn and rice. (see figure 2)

*figure 2: 1: Caloric Energy, Corn (blue), Rice (orange) and Pemmican (grey), in kcals/lb.)*

*Source: author, based on USDA, Nutrient Database, and Wentworth Pemmican Analysis, 1956)*

Comparing so simply carbohydrate rich diets on the eastern side of the divide to the protein and fat heavy diets, on the other side, however, is fraught with problems from the perspective of physiology. Simply having greater calories of energy available in their food did not necessarily mean that it could be used by muscle tissue to do work. Fats and proteins contain greater calories; however, body metabolism derives that energy less efficiently as it can from carbohydrates. Aerobic exercise probably better converts carbohydrates into ATP than it does fat. The fur trade, creating such extremes in diet, for that reason, continues to raise numerous

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questions about its ultimate sustainability in the present day.\textsuperscript{47} The switch from high carbohydrates into an almost exclusive diet of fat and protein, whatever its long term effects on voyageur bodies, all the same, availed significant gains for commercial expansion.\textsuperscript{48} Exercise physiology studies, indeed, have recently suggested that carbohydrates provide “most of the energy for short-term maximal endurance exercise, whereas lipid [fat] makes substantial contributions to the energy requirements of more prolonged exercise,” essentially making these fats most appropriate for the extraordinary long days and almost unlimited outlays of exercise undertaken by voyageurs. Modern day elite athletes, in fact, after adapting themselves to a high fat diet for a number of days are able to undertake ultra-endurance events with the higher energy now available to them without apparently deleterious effects to the body.\textsuperscript{49}

More than simply striking upon an alternative food energy source, then, fats in pemmican likely constituted a revolutionary energy shift to prompt commercial expansion. They undoubtedly increased the very pace of voyaging, allowing paddlers to significantly lengthen in

time and intensity their work, especially now into the farthest reaches of the subarctic. They most certainly bolstered the constitutions and body masses of voyaging crews.\textsuperscript{50}

The switch to a higher energy food source in the fur trade was apparent by the 1790s. By 1792, Montreal companies built their first depots at the head of the Winnipeg River, christened Le Sieur’s, after its builder, but, more commonly known as Bas de la Rivière Winipic. It became, with Cumberland House, the NWC’s key supply base to what was developing as the jumping off to a vast commercial empire. Initially, a modest 100 to 250 bags of pemmican annually were delivered from the Assiniboine and upper Red River posts to this depot, but that quickly ballooned to thousands of bags by the early nineteenth century when a “band wagon” effect – so common in the story of other energy sources in this volume -- brought companies into pemmican production and competed with each other to procure this energy source.\textsuperscript{51} By 1809, Alexander Henry the Younger was mass producing pemmican and shuttling it back from Fort Vermillion, near present day Edmonton. He used 66 bags of pemmican to move a single brigade of eleven canoes (each paddled by five men and one woman) all the way to Bas de la Rivière – about a single bag allotted to each person for the entire trip. Another 40, going the other way, could get the entire contingent to the salty airs of the Pacific on the Columbia.\textsuperscript{52}

The wealth of food energy now available was made manifest at Le Sieur’s Post by the turn of the century. Hardly a starvation zone, Lake Winnipeg now constituted a meeting point for Montreal crews who, after regrouping, competed with each other in great races across the lake to reach the Athabasca district. The first crew arriving won. Sometimes up to a hundred canoes

\textsuperscript{50} Henry E. Hamilton, \textit{Incidents and Events in the Life of Gurdon Saltonstall Hubbard 1802-1886} (The Newberry Library (Graff 1997) 20-21.
\textsuperscript{51} A.S. Morton, \textit{A History of the Canadian West}, 429
\textsuperscript{52} Journal of Alexander Henry the Younger, II 395.
took part. The forty stroke paddle that set pace in corn country was here quickened considerably. As historian Marjorie Wilkins Campbell described it, voyageurs eating pemmican now increased their speed from 40 to 60, then to 65 strokes per minute, with guides in the front of each canoe who “hacked off hunks of pemmican for the straining voyageurs who chewed as they paddled till they verged on exhaustion.”\(^5^3\) The record at such speed was 40 hours of continuous paddling. The bourgeois finally stopped that contest, fearing for the men’s lives.\(^5^4\)

New Energy Regimes: New Human and Environmental Dynamics

Pemmican presented a solution to one of the fundamental logistical problems of the British fur trade. Ironically, it also raised a host of other new problems. As rivals competed to gather pemmican, price escalated. In general, fur traders paid First Nations hunters progressively more for bison products to make more pemmican by the 1790s. In places like the Red River valley, where competition was intense, pemmican was rated at a shilling a pound by the trader Alexander Henry the Younger. The HBC’s own accounts from Cumberland House shows that pemmican, fat and dried meat warehoused at that post was rated by 1810 at 4 pence/lb. That climbed to 5 and 6 pence by 1815 and 1816, and then reached a critical cost by 1821-22 of 8.5 and 9 pence/lb.\(^5^5\) The upwards spiral on prices on pemmican led eventually to the great “pemmican wars” of the region by 1814 when the HBC and NWC attempted to corner the supply on regional pemmican so necessary for their operations. There is no coincidence, too, that the

\(^{54}\) Campbell, *The North West Company*, 44.
most violent, competitive period of the Northwest fur trade, approximately from 1780 to 1821, coincided with the release of comparatively vast amounts of this food energy. Pemmican freed cargo space and allowed for greater energetic output from crews. They could now deliver more goods to Native people, more otherwise heavy and bulky alcohol supplies, more guns, and, because they were competing with each other, use more violence, over-trapping and overhunting as a strategy among nations inland.\footnote{Gerhard J. Ens, “Fatal Quarrels and Fur Trade Rivalries: A Year of Living Dangerously on the North Saskatchewan, 1806-07,” in Vol. I Michael Payne, Donald Wetherell and Catherine Cavanaugh, eds., \textit{Alberta Formed: Alberta Transformed} (Edmonton: University of Alberta Press, 2005) 133-159.}

The Nor’Westers, in particular, gained their reputation as brazen bullies in the 1780s and 90s. Their food supplies could allow them to impose upon, physically threaten and intimidate Cree, Chipewyan and other Athapaskan people. Their behavior more than suggests that fur trade reciprocity, long respected at posts vulnerable to starvation and always needing provisioning from large numbers of hunters, had been decisively upended in the new energy regime. Pemmican, used in transport, or stockpiled for long term storage at a post, gave posts far greater independence from native people and their support inland.

Furthermore, it was after and not before pemmican began to be used that fur trade companies, enjoying greater food security, could embark on environmental scorched-earth policies against their rivals. Given the low carrying capacity of much of the subarctic, better fed traders confidently hired First Nations hunters to trap out and overhunt areas to create game and fur “deserts” to discourage competitors from moving into their hinterlands. By the late eighteenth century, large game deserts emerged in Ojibwa territories in northwestern Ontario and present day Manitoba. By the early 1800s, Montreal companies, and then HBC companies, hired
Iroquoian hunters from the Montreal area to create such deserts in Peace River country, the east slopes of the Rockies, and the Athabasca district.  

Directly impacting Dene and Algonquian seasonal rounds, scorched earth policies all the same manifested the power gained for Europeans in pemmican energy. That power expanded as companies improved larger and more efficient food systems that delivered pemmican from points of supply on the plains, to district depots, and finally by circuitous routes to where it was needed. What might be called “peak production”, however, came after 1821, when the HBC gained monopoly in British territories. At that point, the company fine-tuned a massive food system to support its brigades and post system, and had supply available to support British naval exploration in the Arctic. Food allowed the company to span the continent. Most key in that respect, monopoly allowed the company to suppress prices on its pemmican, dried meat and fat purchases, and set quotas from “districts” it set across buffalo territories. Indeed, when the HBC was created as a monopoly in 1821, in large measure to reduce provisions costs in the fur trade, it was able to drive prices to 4 pence/lb by 1825 and by 1833 to 2 pence a pound. It kept prices on the product low throughout the bison era by using a district ordering system. Since it could buy pemmican products from plains First Nations and Metis groups from any of its three main districts, it could play aboriginal people against each other to cheaper prices.


58 Colpitts, “Provisioning the HBC,” 192.
But typical of moments of cheap energy supply in other settings, the company did what might be expected: it increased, not decreased, consumption. If in 1821, it typically procured 800 to 900 bags of pemmican for its transportation system, it progressively increased purchases in the 1840s to 1200, to 2000 and, by 1869, to 2500. Extraordinary increases in consumption were seen in the now more efficient York boat system: At Norway House, pemmican stocked for crews grew from 7,180lbs in 1822, to 8840lb in 1827, to almost 36,720lb in 1835. In years when pemmican had been so cheaply rated, Norway House crews received in 1832 and 1833, 47,520 and 62,509lb, respectively.\textsuperscript{59} With such abundant supply of cheap energy, the HBC mobilized a fantastic commercial expansion northward and westward to the Pacific. Well-fed brigades could now trade extensively in the Athabasca and Cordilleran stretches of British Columbia. They could also wage war against American rivals north of the Missouri, and, especially, in the Columbia.\textsuperscript{60}

Cheapened food energy had vast environmental consequences. Not only did it prompt an ever larger hunt of the herds themselves by First Nations who were paid low prices for their product. It also gave the company’s traders the purchasing power to amass pemmican beyond their own immediate needs and the district quotas they had to fill. They commonly exceeded quotas to amass “discretionary” stock to be kept on hand in parkland and boreal areas to support First Nations in ever-more exhausted territories to continue to trap and hunt out their areas. Already by the 1800, the HBC was stockpiling so many discretionary funds in pemmican that it could support Wood Cree hunters in the environs of Cumberland House. These otherwise generalist hunters and gatherers, in already overhunted territories, were now trapping intensively

\textsuperscript{59} Colpitts, “Provisioning the HBC,” 197.
\textsuperscript{60} Colpitts, “Provisioning the HBC,” 179-203.
for the market, rather than their subsistence, supported by pemmican kept on hand for them.\textsuperscript{61} By the 1860s, so large were HBC discretionary funds that posts like Fort Ellice could allocate some 3,000 to 4,000lb of pemmican to the Egg Lake and Riding Mountain areas for a single winter to feed destitute Ojibwa on near-exhausted territories. There, they continued to trap and hunt on behalf of the company.\textsuperscript{62}

Perhaps more grimly, however, excess food energy ended up unravelling, not enhancing, human relations in the fur trade. Food fights became common between traders who had better access to larger supply. In 1800, Ferdinand Wenzel, a Nor’Wester employed in the Lake Athabasca area, contended with an XY company and HBC fort nearby. He used his own large pemmican surpluses to deliberately starve out his rivals. After hunting out the environs of the area and stopping First Nations from trading with the XY men, Wenzel waited until they were reduced to eating leather used for window covering, and one nearly starved to death, before purchasing up their stock of goods at a fantastic profit, in exchange for a few pounds of pemmican, enough to supply the traders out of the country.\textsuperscript{63}

No better example of the new human and environmental relations in the energy regime exists than in 1816, when Montreal traders in the Fort Vermillion area deliberately starved to death sixteen HBC employees. That year, the inexperienced and poorly supplied John Clarke was sent to move the HBC into the Athabasca district. Without enough provisions, he decided to relocate his 50 men, in eight canoes, up the Peace River to present-day northwestern Alberta. His Montreal Nor’Wester rival, William MacKintosh, sent his own men ahead of the contingent to fire guns along the river to chase away game and pay off Chipewyans who might otherwise feed

\textsuperscript{61}26 August 1808, \textit{The Journal of Alexander Henry the Younger}, II 345

\textsuperscript{62}Cited in Peers, \textit{the Ojibwa of Western Canada}, 194.
the HBC contingent. When Clarke’s contingent arrived in late fall and the main body took up at a place called Loon River “where the ice stopped them,” they were already out of food. Over the course of the winter, the group desperately broke up in search of support. Given the scantiest aid from their rivals, one of Clarke’s men died of starvation before the men regrouped at the trader’s main post. Three more men died before Clarke finally sold his entire trading supply to the Nor’Westers for a mere 700lb dried meat and pemmican, enough, it was hoped, for an ill-fated evacuation to Fort Chipewyan. Tramping to that centre, all but three of the twelve perished. 64 Ferdinand Wentzel, hearing of incident, reported with satisfaction that “No less than 15 men, 1 clerk with a woman and child died of starvation going up Peace River.” Colin Robertson, looking back on “the starving of Mr. Clarke’s Men in Athapascow,” cited it as “the most deliberate and wanton acts of cruelty towards the Company’s servants” ever.65

Conclusion

The high calories offered in pemmican, delivered in ever-larger food systems, significantly shifted the endosomatic energy regime of the fur trade by the late 18th century. Having reached the end of their food supply by the 1770s, fur trading companies from Montreal or Hudson Bay discovered the vast energy sources to be tapped from seemingly superabundant bison herds on the plains. Metabolically, however, the caloric wealth of pemmican differed from that offered in the corn-based “custom of the voyageur.” Representing a far more compact and higher order of energy, this food fuel allowed for massive and rapid expansion of British commercial frontiers,

63 Colpitts, “Moose-Nose and Buffalo Hump,” 64-67.
especially after 1821, when the monopolized Hudson’s Bay Company fine tuned its food system and used this fuel to entrench itself, and the Empire, in the farthest reaches of the Arctic and Northwestern Pacific watersheds. But the shift into a new energy source presented as many new problems as it did solutions to the logistic nightmares of the fur trade. Pemmican energy shifted more power into European hands and allowed for not only a more intense pace of trade, but increased competition and violence. More importantly, Europeans could use greater food security to change their relationships with First Nations and the environment itself. The expanding market for cheapened pemmican supplies prompted greater hunting “overreach” on the plains. It is clear that the pemmican trade fatefully tipped the balance against the bison herds north of the Missouri River. The suppressed price on this cheap energy source also meant that surplus stocks could be kept at posts in parkland and boreal areas to subsidize more intensive trapping and hunting and, eventually, completely exhaust large regions where overhunting and trapping had already occurred. By the early 1870s, when the bison herds were quickly disappearing from the plains, the HBC perceived the shift into a settlement and missionary frontier. It turned to steamship technology in a bid to rid itself of the dependency on bison fats for its transport system. The first steamship in the west, the Northcote, began plying the Saskatchewan in 1874, just as a pemmican energy crisis fully enveloped the company’s entire transport and post system. The pemmican era ending decisively in 1879 when the last bison herds were seen in Canadian territory, constituted a remarkable early chapter in the larger environmental history in Canada, and certainly the history of energy and power in its past.

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67 On steamship technology, see Innis, *The Fur Trade in Canada*, 343.