# Hunting Caribou

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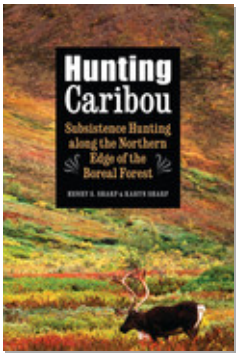


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# Text 2

## *Food Storage*

Abraham was of the generation of elders in 1972. His approach to killing a large animal reflected the practice of times when the Denésuliné lived in the bush and only occasionally came into the settlements that surrounded the trading posts, rather than the practices that had become customary among those who lived in the new permanent and far larger village. He was more concerned with the proper distribution of the moose meat among his kin, affines, and friends than he was in storing meat for his own use during the coming winter.

The practice of widely distributing the meat of a large kill had largely vanished among the then contemporary Denésuliné. Some meat was still distributed along lines of kinship and affinality if those kin and affines happened to reside (and were present) in the village and if relations between the people involved were positive, but the portion of the meat of a kill that was distributed was rapidly declining. There were even instances in which small portions of meat from a large kill were being sold to non-kin. Among the reasons for these changes were necessary adaptations to village life. The village at that time numbered somewhat more than five hundred souls. A pattern of distribution based upon residence within a small bush camp composed of kin, affines, or close friends

simply did not work in the context of so many people living together. Distributing the meat of a moose among twenty or thirty people is a very different thing from trying to distribute the meat of a moose among five hundred people. Moose are large animals, but they are not large enough to be distributed meaningfully among residents of a settlement that large.

The Denésuliné do make dry meat from moose. The taste of moose dry meat is not as valued as is the taste of caribou dry meat, and it does not have the emotional value that caribou dry meat does. The Denésuliné devote less effort to drying moose than they do to drying caribou and prepare it in significantly lesser quantities. Unfortunately, the village conditions—the crowding and the sanitation problems, the large population of sled dogs with their defecation and urination, and the trash buildup that comes from human occupancy on that scale in the absence of any systematic system of trash collection—all combined to make it difficult to make dry meat there. The Denésuliné insist upon clean surroundings for making dry meat, for pragmatic reasons as well as out of a sense of respect for the remains of the animal/spirit that is being processed. The crowding and dirt of the village made it difficult to find a suitable spot within it. A few individuals did put up smoke tents (canvas tipis) or construct small log buildings that could be used for drying meat, but there were few of these.

The village was fortunate to have an Indian Affairs–operated community freezer. Electric service had not arrived until the summer of 1970. Prior to this the community freezer was powered by a separate generator. Its maintenance was not a high priority for the local Indian Affairs agent—who resided in Discha a dozen miles away—and it was not well kept up. Subject to frequent stoppages, it was not a terribly reliable place for a family to keep its food supply. It was also a small freezer for the use of five hundred people. There were problems with the allocation of space within it and with providing security for meat stored there.

Because the village had so recently received electric service and because of the high cost of electric appliances, the vil-

lage had few home refrigerators or freezers in 1972. When the weather was cold enough to freeze meat, if a dwelling had an unheated area or adjunct outbuilding that offered secure storage, it was possible to keep meat for use throughout the winter.

Most of the meat from the moose Abraham killed that fall was distributed along his social networks. The rest was placed in the community freezer for later use by his family. None of it was dried or smoked.

Food storage in the bush is rather different. Away from the demands of the crowded village and the use of electric freezers, the Denésuliné are forced to rely upon traditional methods of food storage. There is variation in food storage practice between those Denésuliné whose lives in the bush are spent in Saskatchewan, especially among those who trap and hunt to the south of the village, and those who spend their bush lives north of the village. The basis for this distinction, aside from the greater access to caribou that those who live toward the tundra have and the seasonal variation in when caribou appear in the different regions, is the distribution of permafrost.

Circumstances of life in the subarctic of the Canadian Shield are always demanding. They are also often quixotic if not downright strange. For dozens of generations individual Denésuliné have found themselves in unusual circumstances (e.g., illness, sudden death, or an accident) in which their ability to store meat or other goods has been a factor in their survival. Their culture has provided them with a basic repertoire of techniques to which they have applied the full range of human creativity to solve the individual problems they have faced. From hiding meat under cairns of rock to hanging it in trees to suspending it under the ice of a lake, the Denésuliné are creative and practical in their approach to storing meat.

The basis for the bulk of Denésuliné food storage is freezing. The temperatures of the subarctic are cold enough that, in normal years, it is possible to freeze meat between October and April by exposing it to the outside cold. The most common manner of freezing meat in the bush is to place it on a "stage." A stage is simply a log platform. Normally rectangu-

lar, it is made by sinking four corner posts deeply enough into the ground to provide solid support for a simple platform of logs constructed near the top of the vertical supports. Stages are usually not constructed just for meat. They serve as all-purpose storage for items that can be exposed to the air and outside temperatures. They are usually made so that the platform is just above the head height of the person constructing the stage. The platform, the storage area, needs to be high enough to be above the reach of any sled dogs that might escape their tethers and get loose in the camp. This height is sufficient to protect what is stored on the stage from foxes (*Vulpes vulpes* and sometimes *V. lagopus* in winter) or other small animals that might get into meat stored there.

Stages used for meat storage offer no protection from wolverine or bear, which are easily able to climb onto the stage or tear it down. Some protection from bears is provided by the fact that the Denésuliné do not begin to store meat upon stages until the weather is cold enough for it to freeze. By that time bears have normally taken to their dens for the winter. For wolverines and late roaming bears, protection of the meat on stages depends upon the activity and presence of humans and dogs in the camp.

Small animals represent a potential threat to meat stored on the stages. Mice do not seem to pose much of a problem; gaining access to the stage may so expose them to predators that they are reluctant to take the risk. A greater threat comes from birds. Ravens are potential scavengers upon the meat stored on a stage, but the primary culprit, certainly the one that most upsets the Denésuliné, is the whiskey jack (northern or gray jay, *Perisoreus canadensis*). These birds are virtually fearless and have a high tolerance of the presence of humans. They will come to the meat even when people are walking around the camp or sitting and working right by the stage. Whiskey jacks are particularly drawn to animal fat.

Denésuliné prefer to hang the fat from caribou to dry before putting it away for winter storage, particularly the large sheaths of fat that build up on the backs of the bulls. Winter storage

of fat is normally inside the dwelling, suspended from the roof or rafters or placed inside a separate unheated outbuilding if one has been constructed. The whiskey jack's predilection for fat is a constant annoyance while the fat is drying. Whiskey jacks peck at the fat or meat in such a way that they drill conical holes into it as they eat.

Fat is rarely stored on a stage after it has undergone its initial drying. It is so valuable and fragile that it is moved into more secure storage. When winter comes, Denésuliné field butchering switches from always skinning the caribou that are taken to often leaving the hide on the caribou—both as parts of dismembered caribou or over the whole carcass if it is not dismembered. The hide provides the meat with some protection against freezer burn—surface dehydration of the meat in the extreme cold—as well as some protection from whiskey jacks and ravens. Meat on a stage is often covered, usually with plastic sheeting or a tarp, to provide additional protection and to keep moisture, wind-blown sand, or other contaminants away from it.

Meat stored on the stages is either cut into sections for ease of later preparation or left as an entire carcass. The Denésuliné do not bring entire carcasses into the dwelling for thawing and preparation for cooking. The preference is to bring in a smaller section, such as a leg or a neck. If meat is left on the stage as an entire carcass it is far more difficult later to cut sections from it for cooking. There is a tradeoff between doing the butchering under unpleasant outside conditions at the time of the field processing and the inconvenience of later having to separate off a portion of suitable size to be brought into the dwelling and thawed for cooking. Bow saws, which are normally used for cutting firewood, are a remarkably effective and widely used means of cutting usable-sized portions off a frozen caribou carcass. Somewhat surprisingly, chain saws have their proponents for this task.

As the weather cools in the fall, particularly after the fall snow accumulation has begun, Denésuliné men living near the tundra often build up meat piles in the bush. Space on the

stages in the camp is almost always at a premium. Meat piles in the bush are convenient and disperse the hunter's winter meat supply over a number of locations within a larger area rather than gathering it into a single location with the attending risk of losing it all in a single incident. The risk is that bush meat piles are unattended and more vulnerable to scavenging by other species.

We have never wintered in the bush within the full boreal forest—with its higher concentration of life and its wider variety of species—and are not sure how the practice of making meat piles works there or even if it is attempted. We do know that hunters there do make meat caches and that hanging meat from trees is more common. Denésuliné along the tundra edge accept that rodents, rabbits, foxes, squirrels, birds, weasels (*Mustela nivalis, M. erminea*), and other small species will scavenge meat they have stored in the bush. When they pile meat in the bush, they take considerable effort to stack the meat carefully and cover it with brush and other locally available material. They attempt to ensure that the meat is not exposed to the air in such a way as to give access to other species, and they construct a covering that is heavy enough to prevent small animals from displacing it or digging through it. Some animals are capable of reaching the meat no matter how well it is protected. Rabbits and foxes will tunnel under the meat and come up to it from below, a method that utilizes their digging skills and provides a way for them to access the stored meat without being visually exposed to their own predators. Denésuliné watch to see what has been trying to gain access to their meat piles and often use their meat piles as bait and set traps around them.

The primary protection for a covered meat pile is the fact that it will freeze into a solid mass, one that is too heavy for small animals to dislodge and spread around. They can gnaw at the edges, as it were, but they cannot cause serious damage to the stored meat. With larger predators, primarily wolf and wolverine once bear have denned for the winter, there is less possible protection for the meat. Wolves are remarkably

shy animals, even this far into wilderness, and are reluctant to approach or tear apart things that smell of humans. This provides some protection to the stored meat. Wolverine are a different issue. Nothing the Denésuliné can do can protect a meat cache from a wolverine. One year George used fifty-five-gallon metal drums sealed by metal bands with locking clamps to store goods within his cabin, as he had been having problems with them getting in and destroying his supplies while he was gone. There is no way to be sure, but the wolverine that got into the cabin and opened the clamps on the barrels and destroyed their contents or scattered them all about the cabin was either frustrated by the effort it had had to spend figuring out how to work the clamps or was particularly playful after having figured out how to work them. If a wolverine discovers the meat cache, it is gone. The only real protection from them is their scarcity.

The Denésuliné in this area do not dig pits into the permafrost to act as natural freezers.

Freezing is not the only method the Denésuliné practice to store meat, although it is the primary long-term storage method. There are a variety of short-term storage methods, some of which still receive occasional and sporadic use. Presumably they made greater use of these methods in the past, but only presumably, as we have no real data on this. Essentially, all the methods that do not involve preparation of the meat are forms of refrigeration based on the presence of permafrost. In those areas where the permafrost is continuous, it lies close to the ground surface. Most all of the land that is not solid rock or sand has permafrost within a few inches of the ground surface. In sand deposits the sand may thaw to a depth of several feet during the summer. Fred Riddle commented that the deepest he had ever seen sand thaw during his more than thirty-year experience of the area was to a depth of four feet. Unfrozen sand more than a foot down is cool but not cool enough to preserve food.

Use of permafrost as a means of storing food generally involves lifting away the surface cover until a frozen surface is

reached. The food can be placed there and then covered by the surface cover. This works best under heavy moss growth—to insulate the top of the covered food—or within muskegs (the colloquial term applied to almost all northern bogs, swamps, or wetlands). Storing food within a muskeg is essentially the same process as storing it under moss. A place is prepared so that the food rests on the frozen permafrost, and it is then covered by the vegetation of the muskeg. Storage in a muskeg adds two things that are lacking in storage under moss. The water of the muskeg is cold and acts to cool the food placed under it. And it is harder for passing scavengers, all of which rely at least to some extent upon scent to locate their food, to detect meat that has been stored under water than it is for them to detect food that has been stored under moss.

The water of the lakes is sometimes used for short-term food storage, but it is not a favored method. Lake water remains quite cold throughout the year, but it does warm significantly in shallow areas and at the top surface of the lakes. Most areas along the shores are shallow enough at the lake margins to warm during the summer. This reduces the effectiveness of the lakes as a place to store meat. Placing meat in the lakes is normally done only as a temporary measure to protect meat that is awaiting shipment south to the village or processing into dry meat. Putting meat in the lake is better than letting it sit in the warmth and sun on land, but it begins to deteriorate quite quickly underwater. Even if it does not spoil, its texture changes and its taste deteriorates.

It is difficult to imagine immersion in the cold water of a pond as an effective way to store the carcass of one of the megafaunal animals, as has been postulated for mammoth remains. Even if the meat did not decompose so badly that it could not be consumed, it would rapidly deteriorate in taste, texture, and quality. It would take exceptional circumstances to draw a human group back to such a stored carcass rather than seeking out alternate and fresher sources of meat.

Cooking meat often serves as a means of short-term storage. Temperatures in the subarctic are often cool enough, even in

midsummer, that the temperatures inside dwellings can preserve portions of boiled meat for a week. This is less a deliberate strategy of food preservation than an accidental but useful byproduct of cooking food for consumption. Boiled meat is normally consumed long before it risks going bad. The labor and effort involved in building a fire and enduring its heat during the summer tend to limit summer cooking, especially inside the village where cooking occurs indoors. This is less of an issue in bush camps. The crowding and dirt of the village inhibit cooking outside, but these conditions are not applicable to the bush camps. These all have a specific area for an outside cooking fire, and the area is kept clean of litter. Cooking outside also disperses the heat of the fire so that it does not warm the dwelling. With cooler weather, a fire is normally kept burning when people are awake. It is common to keep a pot of food on or by the stove so that it is available on demand throughout the times people are awake. Much cold weather cooking is less an issue of making a specific meal than one of adding to the existing pot.

For several hundred years the Denésuliné have used Western foods in their diet. Transportation from the points of trade to the bush camps was so limited that their primary concern was with basic staples such as flour and lard. They made more limited use of other kinds of consumables, such as tea, tobacco, and treats for the children. These are items that have been shipped in to the points of trade from long distances away, and they are generally well packaged to survive that shipping. Storing these items in the bush normally means keeping them where they will stay dry and can be kept away from animals. If the primary camp dwelling is a cabin, they are normally kept in the cabin. If the camp lasts long enough, a separate log storage building may be put up. If the camp is in tents, as is often the case from the late spring to early fall, storage of these goods is more of a problem. If a stage has been constructed, it can be used if the goods are wrapped sufficiently well to protect them. Otherwise, it is necessary to keep them inside the tents.

Preparing meat for storage can increase the length of time it can be stored. It can reduce the vulnerability that comes from depending upon extremely cold weather for its preservation. It can also significantly reduce the bulk and weight of the stored meat, which greatly increases the ability to transport the meat that has been prepared. Of all the ways that humans have developed to allow meat to be stored for long periods of time—for example, salting, pickling, or smoking—the Denésuliné have settled upon air drying as their favored method of preservation. Fresh meat is virtually always their preference for consumption. Frozen meat is never preferred over fresh meat. At times dry meat may be preferred over fresh meat. Dry meat, particularly dried caribou meat, is emotionally and symbolically loaded in ways that frozen meat is not; it has qualities of meaning that the Denésuliné value above its taste. When they are first able to make it in a season, it is often preferred to fresh meat. It is also highly desired when they want variety in their diet.

If fresh meat is their preference for consumption, freezing is their basic method of meat storage. They freeze far more meat than they dry, and they consume far more frozen meat than dried meat. Air drying is their secondary method of meat preservation. In principle, it should be possible to dry the meat of any animal found within the lands the Denésuliné occupy. Air drying is exactly what it sounds like. The meat is prepared (as described later) and exposed to air. The exposure dehydrates the meat, at once reducing its weight by more than 50 percent and also reducing its moisture content such that the growth of bacteria is seriously retarded. Once dried, the meat can be stored for periods of longer than a year provided it is kept dry and receives adequate ventilation.

The presence of fat in or on the surface of the meat is one of the difficulties that must be addressed in preparing meat for drying. Fat obviously increases the energy content of the dried meat and does wonders to improve its taste, but it is difficult to dry animal fat well enough to preserve it. Wild animals rarely build up fat within their muscle tissue the way domes-

tic animals (many of which have been specifically bred to do so) do. When wild animals do accumulate fat, it tends to form either internally around their organs or in deposits between their skin and their muscle tissue. This makes it easier to separate it from the muscle tissue and consequently makes their meat easier to dry. Few of the animals the Denésuliné kill have fat throughout their tissue, and those that do are not made into dry meat. Some, such as porcupine or beaver, which can have areas with dispersed fat deposits, may be smoked rather than air-dried, but this is more or less a side activity done for variety in the diet rather than a basic means of meat storage.

At the present time the Mission Denésuliné dry caribou, moose, and fish on a regular basis. Other animals can be and are made into dry meat but on a far more irregular basis. Animal fat, once separated from muscle tissue or the internal organs, can be air-dried. Bear fat can be dried or cooked down into grease, and bear are routinely taken for this purpose. We have little indication that bear meat, which can carry trichinosis, is made into dry meat, although in 2001 during Karyn's field season, the community was being treated for a wide outbreak of trichinosis from bear meat that had been dried and shared widely within the community.

There are indications from very limited comments informants have made that in the past there was a trade in pemmican and buffalo meat that passed between the southern part of Denésuliné range in Saskatchewan and Fort Chipewyan in Alberta. Because the individuals who talked about this trade had a family ancestry among the Denésuliné of English River along the Churchill drainage, it was not possible to determine when or if this trade passed through the Discha area or if it was directly between the Churchill River drainage and Fort Chipewyan. What is interesting about the comments is the fact that they specifically described the trade as involving two different kinds of buffalo. This raises the possibility that musk ox was one of the species called buffalo, implying a meat trade running from the tundra to the prairie, rather than indicating a distinction between two subspecies of buffalo—wood buf-

falo (*Bison bison athabascae*) and plains buffalo (*B. b. bison*). Musk ox is no longer found within the area used by this band of Denésuliné, and this was the only reference to their possible use as food that we encountered. During Karyn's more recent fieldwork, however, she witnessed an encounter between Denésuliné hunters and musk ox. Although they chose not to pursue it, it was clearly within the range of animals they considered suitable for consumption.

The Denésuliné do dry fish for human consumption. This practice, which involves splitting the fish and hanging it, is to be differentiated from the practice of hanging fish for dog food. Drying fish is more an activity of the forest, where fish make up a larger part of the Denésuliné diet than for the Denésuliné who live near the tundra edges. They dry a variety of fish species, and the product is quite tasty but does not last long. It is normally prepared during the late winter or early spring spawning runs and is usually consumed within a few weeks of being made.

Caribou dry meat is exactly that: dried meat. It is not cooked. To dry the meat, the Denésuliné construct a drying platform on which the cut meat is exposed to the air. There is no consistent pattern to the shape or size of platforms. That is a function of individual preference combined with the local topography and the placement of dwellings around the camp. The amount of meat to be dried is a major factor in determining the size of the dry meat rack. Dry meat racks are placed in an area that is clean and dry. The people cutting the dry meat and attending to it while it is drying have to spend hours around the dry meat rack. It is therefore desirable to build the rack where it is protected from wind and blowing sand.

The two most common shapes of drying racks are rectangular and A-framed. The rectangular racks look like smaller and narrower versions of the stage that is constructed for storage. But there is no platform on the top of a dry meat rack. Instead poles are laid across its narrow width. Dry wood is used for the construction of the rack. The willow that grows near the tundra does not grow large enough to be used for any

but the smallest drying racks. This forces the Denésuliné to use spruce or other woods. It would be possible to use green wood for the corner support poles, but the poles that hold the meat while it is drying must be dry wood. Green spruce wood contains too many chemicals that would retard the drying process as well as imparting an unpleasant taste to the dry meat. The A-frames look much like a wide household ladder, with the poles for holding the drying meat on both sides of the A-frame, replacing the steps.

In drying racks of either shape, the cut meat is draped over the cross poles. Nothing is used to hold the meat to the racks. Hanging it this way allows the cut meat to hang downward to expose the maximum surface area to the air. The poles supporting the meat must be high enough to ensure that the hanging meat does not come in contact with the ground. The higher the meat is above the ground after it is hung, the safer it is from dogs that have escaped their tethers or from the depredations of small children who do not want to wait for the drying process to be completed. Rectangular dry meat racks are normally constructed when it is anticipated that larger quantities of meat will have to be processed. A-frames are normally used if smaller amounts of meat are anticipated.

Cut meat in the process of drying has to be watched and attended. It is turned periodically to promote more uniform drying. It has to be protected from moisture and is brought inside if it starts to rain. It is brought inside each evening as the day begins to cool and darken and is kept inside overnight. It is not placed back on the racks until any morning dampness or fog has dissipated.

There is variation in practice in determining how long the meat has to hang before it is ready to pack away. Assuming reasonable conditions—no rain or dampness, moderate temperatures, etc.—the meat needs to hang for three days to reduce its weight by roughly 50 percent. It can be consumed by the second day before it is completely dried, but at that point it cannot be stored except by freezing it. There is variation in Denésuliné practice—as well as the opinions of the authors—about

hanging the meat for a fourth day. Unless conditions have been ideal, meat packed away on the third day is more vulnerable to damage while stored and will not last as long as meat hung for a fourth day. The fourth day of hanging further reduces its moisture content, making it better suited for long-term storage. It also makes the meat harder and more brittle—whether this is desirable is a matter of individual preference—and better preserves any fat within the meat. Obviously the length of time the meat needs to be hung depends upon the specific situation. Variations in temperature or humidity can lengthen or shorten the amount of time the meat needs to be hung before it reaches a state suitable for long-term storage. Variations in the skill of the person cutting the meat and the uniformity with which it has been prepared have similar effects upon the drying process.

Dry meat that is improperly dried is vulnerable to rapid spoilage. If the meat has been cut too thickly, the outside may appear to be properly dried while the inside still retains too much moisture for it to keep for lengthy periods. Spots on the improperly dried meat that have too high a moisture content are vulnerable to bacterial growth and can become fly blown. It is somewhat annoying to pull out a piece of dry meat, only to find parts of it covered with maggots or discolored by bacterial growth; it is far more serious an issue if the dry meat is the only food in camp. The skill of the person cutting the meat is a crucial factor in successfully preparing the meat to be dried. There is a premium on getting a rough uniformity of thickness in the raw meat if it is to attain a uniform state of dryness. Skill and effort play a similar role in the actual drying of the meat. If it is not turned regularly or if it is improperly turned, or if there are places where the meat has become folded, it will not dry to a uniform state. Successfully drying meat demands a great deal of skill, work, and experience.

The Denésuliné traditionally made a variety of containers to store dry meat. A favorite was to use the unprepared hide of the forelegs of caribou being butchered for dry meat as material to sew into a hassock-like sack. Gym bags and carryalls

were quite commonly used during the 1970s and 1980s. The crucial aspect of whatever is used for storage is that dried caribou meat has to be exposed to adequate air circulation to prevent moisture from building up inside the container. Trapped moisture within the container rapidly leads to the growth of mold and bacteria that ruin the dry meat. Wrapping it in plastic or using air-tight plastic containers also leads to rapid mold and bacteria growth upon the dry meat and ruins it.

Caribou being processed for drying are normally stored in the form of skinned and sectioned portions of the carcass. When it is to be prepared, the preparer gathers together a sufficient supply of meat for the work session. The preference is to work through the available meat by doing one kind of cut at a time. Hind legs are usually the first part of the caribou that is prepared. The preparer gathers a sufficient number of legs for the session's work at a location by the rack where it is comfortable to sit down and there is a large enough flat area to work. This area is covered, either by plastic sheets (tablecloths were favored) or by spruce branches in the absence of plastic. The meat is removed from the bones and piled within easy reach. The long bones of the leg are set aside and saved if they are to be split for marrow and boiled down for grease.

The piled meat is cut piece by piece. There seems to be a preference to start with pieces of meat that are slightly smaller than an American football, although during Karyn's fieldwork she observed a preference for working with smaller pieces. Meat does not grow in rings the way trees that live in a seasonal climate do, and cutting dry meat almost seems a way to correct that condition. The meat is carefully cut with a sharp knife—simple carbon steel blades that can be sharpened with a file are preferred—almost like a section of tree trunk is peeled for making plywood. The idea is to generate a sheath of meat approximately six to eight inches wide by two and a half to three feet long, by roughly 3/8 of an inch thick. Obviously, the size of the sheath generated depends upon the size of the piece of meat being cut. The intent is to create a sheath that can be hung over the poles of the drying rack that is heavy

enough to stay in place once it has been laid over the pole yet still expose the maximum surface area to the air. Once a quantity of meat has been cut into proper shapes, it is hung on the drying rack. Work normally continues until the prepared meat supply is gone or the drying rack is full.

Cutting meat is hard and tiring work. It involves very sharp knives. Cuts are common even among the most experienced preparers. Dry meat is prepared throughout the year if there is a sufficient supply of fresh caribou. It becomes an indoor activity only when temperatures outside become too cold to dry the meat rather than freeze it. The whole activity, including hanging the meat to dry, must then be moved inside. Denésuliné bush cabins do not have high roofs or ceilings. Meat being dried inside must be hung from poles stretching across the cabin and has to hang down into the parts of the cabin where people walk and live. It can become a bit of an obstacle course to move around a twelve by fourteen-foot cabin that has hundreds of pounds of drying meat hanging down from just above head height inside the dwelling. Work that is tiring and demanding in the comfort of nice weather is far more demanding during the colder and harsher outside conditions that characterize most of the year in the subarctic. The meat is almost always cool or cold from how it has been stored before processing and the outside air temperatures are rarely ideal. This is work often done without wearing gloves. Hands become cold from the air and handling the meat. Even with ground cloths to sit on, the ground a few inches above the permafrost becomes cold to sit on and the outside air adds to the discomfort of the person cutting the meat. Denésuliné prefer to work at cutting meat in stints broken by doing other things or moving around to get a break, but it is often necessary to work more or less continuously for hours at a time in order to get the job done in the face of less than ideal weather conditions or the volume of meat to be processed.

Dry meat is sometimes smoked as well as air-dried. The use of smoke is not for purposes of preserving the meat. Small fires, almost smudge fires, are built under the drying rack. Again,

wood choice is a critical factor. The wood must be dry and free of the sap that permeates so many of the spruce and pine trees of the area. Burning these to produce smoke causes the dry meat to take on a foul taste that essentially prevents it from being used for human consumption. Finding and hauling in an appropriate supply of wood for the fire is time-consuming and is a task passed to the children of the camp whenever possible. The smoke from the fire under the drying meat is never allowed to become too heavy or too abundant. The reason for the smoke fire is to keep flies away from the meat while it is hanging so that they do not lay eggs on it. Even if conditions are such that the fly eggs do not survive to hatch, the eggs have to be scraped off the meat; an avoidable demand on time and labor at a time when time and labor are in short supply. In practice, use of a smoke fire seems to have more to do with the taste of the finished dry meat than with anything else. Some people like the taste smoking adds to the dry meat and smoke their meat. Others do not like the taste of smoke on their dry meat and do not smoke it during its preparation.

As noted, a few Denésuliné built smoke houses in the village, but it was not possible to determine whether these were actually used for smoking meat to preserve it or simply combined smoking with air drying. Smoking and air drying are used in combination in the bush to preserve heavy cuts like shoulders, hips, necks, or ribs. With these thicker pieces, the meat is not dried all the way through. Instead, the outer surfaces are dried and smoked to a sufficient thickness to protect the inner portions of the meat from exposure to the air and to biotic contaminants. The undried interior meat changes in texture as it is treated, but it still remains raw. It is cooked before it is consumed. It takes far longer for these thick pieces of meat to air dry. They often have to hang for more than a week to reach a degree of dryness that will preserve them. When this is done, there is an effort to make sure that they are placed on the drying racks away from the thinly cut drying meat. Over the course of the time it takes the thicker pieces to dry thoroughly enough to be preserved, they receive a much

heavier dose of smoking than does the thinner cut meat drying on the same rack.

It is possible to smoke or dry entire gutted small animals. We have seen them but we did not observe any being prepared.

Making grease from animal fat and bones is another way to preserve animal tissue. Rendering fat by boiling it is mostly used to extract a finer grease from bear fat. As far as we know, bear fat, unlike caribou fat, is not eaten without being processed. Caribou fat is used for cooking, although lard has become so readily available with the use of aircraft to enter and leave the bush that it has almost completely replaced the use of caribou fat for cooking or making bannock (the northern homemade bread prepared in a cast-iron skillet). Caribou fat is normally eaten directly to accompany either cooked caribou or caribou dry meat. Individual portions are cut from the air-dried fat taken from the backs of bull caribou in the late summer to early fall season.

Bones provide both marrow and grease. During our fieldwork we saw no preparation of marrow for storage. It is a highly desirable food, but there is very little of it in an animal carcass, especially if there is more than one person to feed. Marrow is normally consumed as soon as it is removed from the long bones of the caribou legs and is generally available only when the long bones collected during dry meat making are split to be boiled for grease. In all the food preparation and butchering we saw, marrow was never more than an incidental treat, mostly consumed by children. It was never separately processed or harvested. If it was not eaten on the spot it might have been boiled along with the bones, but we never saw this happen. We never saw a hunter extract marrow during field butchering or consider marrow as a factor in determining what portions of a carcass to bring back to camp.

Given the emphasis placed upon marrow as a food resource in the course of human evolution, we should perhaps stress these points. Marrow is a rich and nutritious food that is often available to be scavenged from kills made by predators of other species. Unfortunately, there is not very much of it

in any given carcass. While there may be enough marrow in an animal carcass to make it a worthwhile food for a single animal to scavenge, there is not enough marrow to be found in a single carcass to make it a significant food for more than one human-sized scavenger. Whatever the role it played in the course of human evolution may be, it was never a worthwhile food source for groups of human ancestors.

Boiling bones is the last step in the dry meat making process and has become increasingly rare with the ready availability of lard. When grease is made, the bones are split or fractured. A hatchet is the preferred tool for breaking bone for boiling. Both the blade and the flat hammer portion of the hatchet are used to break the bone apart. The blade is used to split the bone lengthwise if there is marrow to be extracted; otherwise the hammer portion is preferred as it produces smaller pieces of bone, from which more of the grease can be extracted. The bone pieces are placed in a large pot partially filled with water over an outside fire and allowed to boil until the grease is extracted. Boiling bone requires a very hot fire and is a slow process. It is one of the few cooking or food preparation activities considered dangerous enough that small children are kept away from the area where it is being prepared.

During the time of our fieldwork, the only non-meat products of the bush that were preserved were berries. These were gathered in considerable quantities as they became available throughout the summer, but virtually all that were gathered were eaten fresh or made into jam. Winter storage of fresh berries was a thing of the past. Some were occasionally made into jam, but they generally had better uses for the sugar they could afford to haul into the bush than using it to preserve berries for winter consumption. Jam was regarded as a treat and did not last long before it was consumed.