

The Pemmican Manual



by
Lex Rooker

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Dehydrating meat products does not reduce the health risks associated with meat contaminated with Salmonella and/or E. coli O157H7.

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Pemmican is a concentrated nutritionally complete food invented by the North American Plains Indians. It was originally made during the summer months from dried lean Buffalo meat and rendered fat as a way to preserve and store the meat for use when traveling and as a primary food source during the lean winter months.

When pemmican was discovered by our early Frontiersmen (explorers, hunters, trappers, and the like) it became a highly sought after commodity. The Hudson Bay Company purchased tons of pemmican from the native tribes each year to satisfy the demand. The basic unit of trade was an animal hide filled with pemmican, sealed with pure rendered fat on the seams, and weighed about 90 pounds. As long as it was kept away from moisture, heat, and direct sunlight, it would last for many years with no refrigeration or other method of preservation.

There appeared to be two types of pemmican. One was a mixture of 50% shredded dehydrated lean meat and 50% rendered fat by weight. The other mixture was similar but contained 50% rendered fat, 45% shredded dehydrated meat and 5% dried and ground berries by weight. The berries were typically Saskatoon berries which grew in abundance in the Great Plains area, and are similar to blueberries.

There is much controversy as to whether the natives included the dried berries in the pemmican they made for themselves or whether they added it only to the pemmican they sold to the Hudson Bay Company “because the White Man preferred it that way”. I’m of a mind that the natives consumed it both ways. The Journals from the Lewis & Clark expedition clearly state that the Indian tribes they encountered consumed some berries, fruits, and tubers as part of their diet. It seems reasonable that the inclusion of some dried berries would not be out of character for the batches of pemmican made in late summer when ripe berries were available. Berries do not appear to be a nutritional requirement and they increase the chance of spoilage, so the pemmican formula in this document is for meat and fat only, and does not include them.

Please bear in mind that pemmican is NOT a raw food, as the fat needs to be heated above 200 deg F. in order to release it from its cellular structure and drive out the moisture. It is therefore not recommended as part of a daily RAF (Raw Animal Food) diet. However, it is a useful compromise when one is traveling, for use as emergency rations, or when otherwise high-quality raw animal foods are unavailable.

It is important that the lean meat used in pemmican be dehydrated at a temperature below 120 def F., and a temperature between 100 deg F. and 115 deg F. is ideal. Temperatures above 120 deg F. will “cook” the meat and will severely compromise the nutritional value of the pemmican. Federal and State laws require commercial dried meat products like jerky to be raised to a temperature above 150 deg F. which cooks the meat to a well-done state and makes it totally unsuitable for making pemmican.

Nutritional Issues

The nutritional qualities of pemmican are unmatched when it is properly made. It can be eaten for months or years as the only food and no nutritional deficiencies will develop. Yes, that is correct, no fruits, vegetables, grains, or dairy products are required to maintain perfect health – just properly made pemmican and water.

Vitamin C and scurvy is often brought up as a concern. Explorers, hunters, and Native Americans have demonstrated over and over that consuming raw meat or meat that was dried at a temperature below 120 deg F., as long as there is sufficient fat present to supply enough calories, will maintain perfect health and prevent or cure scurvy. Those who consume salted and preserved meats, biscuits, and other processed foods, even when lemon juice is added to their diet, will often die from scurvy or other nutritional deficiencies.

Calcium and weak bones is another concern. Due to the advertising of the dairy industry, it is believed that milk, cheese, or other dairy products are essential to maintaining good bone density. It has been shown that people eating a diet of meat and fat, where the animal consumed was allowed to eat its natural diet, (usually grass), bones developed normally and remained strong with no sign of deterioration.

For the best quality pemmican, use red meat, (deer, beef, elk, bison, etc), and the rendered fat from these same animals. The animals should be grass fed or have eaten their natural diet in the wild. DO NOT include nuts, seeds, vegetable products, vegetable oils, grains, beans, or dairy products of any kind. A small amount of well dried berries (blueberries, Saskatoon, strawberries, etc) is the only acceptable addition and should not exceed 5% by weight should you choose to include them.

Directions

Ingredients:

Equal amounts by weight of very dry red meat and rendered beef tallow. If you have one pound of dried meat then you will need one pound of rendered beef tallow, two pounds of dried red meat then two pounds of rendered beef tallow, etc.

Rendering the Fat

Rendering fat is a simple process and most of us are familiar with it as it is one of the end results of frying bacon. The process of frying the bacon releases the fat from the cellular structure of the meat and drives off the water. It is the boiling off of the water that actually makes bacon pop and sizzle. The fat itself just turns to a liquid.

Our goal in our rendering process is a bit different from frying bacon in that it is the fat we wish to keep rather than the crisp “cracklin’s”, which by the way taste good when they are still warm with a bit of salt. If you don’t want them they make wonderful dog treats when cool.

We also want to keep the ultimate temperature of the fat as low as possible. I try to keep it below 250 deg F. and usually shoot for a final temperature of around 240 deg F. You gain nothing by raising the temperature any higher than 240-250 other than more damage to the fatty acids which we want to avoid as much as possible. In short, you need the temperature high enough to boil off the water in a reasonable length of time, but as low as practical to maintain the nutritional value and not denature the structure of the fatty acids any more than necessary.

There are two generally accepted methods of rendering. One is to place the fat in a pot and heat it on the stove top. The other is to place the fat in a roasting pan and put it in the oven with the temperature set between 225 – 250 deg F.

The stove top method can be completed in about one hour and requires constant attention. The oven method takes 12 hours or more, but can be left unattended during the entire process. I will be covering the stove top method here with comments on the oven method mixed in but not demonstrated.



Cut the fat into small pieces about ½” square. Place the diced fat in a stock pot or pan. I select my pot size such that the raw fat fills the pot about ¾ full. This gives me head room to stir and mix without slinging fat all over the stove or counter. It also fills the pot deep enough with the liquid fat so that I can use a candy thermometer to keep track of the temperature.

If you are using the oven method just put your fat in a good sized roasting pan and pop it in the oven set between 225 to 250 deg F and then go away for 12 to 24 hours. The oven thermostat will take care of the temperature for you.



Set your burner to medium high heat and stir well about every minute or so for the first 10 minutes. This will keep the bottom from overheating while enough fat is being liberated to cover the bottom of the pan.



After about 10 minutes you'll see a pool of fat forming on the bottom which should be merrily boiling away. You can now rest a bit and stir every 5 minutes or so just to keep things well mixed.



After about 30 minutes the liquid fat should be deep enough to cover all the chunks and it should have the appearance of a rolling boil. Reduce the temperature to medium heat and put a candy thermometer into the fat making sure it does not touch the bottom of the pan. The water boiling off the fat will keep the temperature around 220 deg F for a while, but there will come a point where the temperature will start rising.



Keep stirring occasionally and keep your eye on the thermometer. As it begins to rise, lower the heat setting to keep the temperature around 230 to 240 deg F. The picture above is after about 45 minutes. The cracklin's are beginning to turn dark in color, the boiling is slowing down, and the temperature of the fat is rising requiring close attention to the heat setting.



After about one hour the major boiling action will have stopped and there will just be small bubbles rising from the fat. 90% of the cracklin's will be a chestnut brown color. The lighter chunks may have a bit more fat left in them, but it is not worth the effort to extract it. If you did the oven method, the fat in your roasting pan should have a similar look.



Now take a good sized strainer and place it the container where you will store your rendered fat.



Line the strainer with a single layer of paper towel. This will filter out the sediment and just allow the liquid fat to drip through.



From your pot or roasting pan pour the fat, cracklin's and all, into the lined strainer. Press on the cracklin's with a serving spoon to press as much fat out of them as possible.

When you've gotten all the fat you can, remove the strainer and set the container aside to cool. You can sprinkle the cracklin's with a bit of salt and pepper and enjoy them as a snack, set them aside to cool for dog treats, or discard as you wish.



The square tub on the left is tallow that was rendered from the fat of grass fed animals. It is a deep butter yellow from the carotinoids (the fat soluble vitamin "A" precursor that gives carrots their orange color) that gets stored in the animal's fat from the green grass they eat. The round bucket on the right is the tallow we just rendered from fat that I got from a local market. The putty color is typical of the fat rendered from grain fed animals. There is little or no carotene stored in the fat of grain fed animals.

There is also a major difference in the fatty acid profile of grain-fed vs grass-fed animals. The grass fed animal fat is between 25 and 50 percent healthy Omega 3 fatty acids. The grain fed animal's fat is only 2 to 3 percent Omega 3. Omega 3 fatty acids are critical to the development and maintenance of our brain and nerve tissue. Overall, the meat and fat from grass fed animals has far greater nutritional value than grain fed beef. Therefore, if you want to make pemmican that meets all nutritional requirements without the need for additional supplementation, both the lean meat and the fat should come from grass fed animals.

Dried Meat Preparation

To make any useful amount of pemmican, a large quantity of well dehydrated lean meat is required which does not lend itself to the use of small tray-type food dehydrators. The plans for a simple dehydrator that can be built for less than \$20 and will hold a full 10 pounds of raw meat is available here: <http://www.rawpaleodiet.com/uploads/JerkyDrierInstructions.pdf>

These plans also give full instructions for dehydrating meat at low temperature for making jerky, or if the meat is left unseasoned, for making pemmican. Generally, well dried meat will weigh just slightly less than 1/3 of its raw weight. Therefore, 10 pounds of raw lean meat will yield about 3 lbs of thoroughly dehydrated meat. Since pemmican is 50% fat and 50% dried meat by weight, 3 pounds of dried meat will make 6 pounds of pemmican which will be equal to about 18 pounds of fresh meat.



Start with well dried red meat. Beef, Bison, Deer, Elk, etc. Make sure that the strips of meat are thoroughly dry all the way through. Any observable moisture in the meat will provide an environment for mold and bacteria to grow. If the strips of meat are bent double they should crack and not be rubbery.

Traditionally the meat used for pemmican is dried without salt or any other seasoning. If you choose to season your meat I suggest that you go very lightly – less than half of what you would use for jerky. Use only dry spices like garlic powder, pepper, cumin, chili powder, and salt etc. NEVER, NEVER, NEVER make pemmican with meat that has been marinated in soy sauce, wine, or any marinade that contains sugar of any kind, and no vegetable oils of any type. I always make my pemmican without salt or seasoning and usually prefer eating it that way, but on occasion sprinkle a bit of salt or steak seasoning on it at the time I eat it for a change of pace – be careful, a little bit of seasoning goes a long way in this dense food.



Grind the meat to a fibrous consistency like a fluffy, but slightly chunky mulch. I use a meat grinder with the largest plate (biggest holes) possible. The grinder above is a large #32 manual ChopRite with a 1 ½ horsepower motor in place of the handle, and fitted with a “bean” plate that has 3 very large oval holes. If you attempt to use a plate with small holes, (½” may work, ¾” or larger is much better), the holes will clog, the grinder could lock-up, and you may damage it. Feed one strip at a time and wait until the exit holes begin to clear before adding the next strip. If it is too chunky and not well shredded, run it through a second time.

Alternatively you can shred the meat in a food processor using the steel blade, or in a blender. When using these options it will be helpful to chop the dried meat into smaller pieces, and some people pick up the blender and shake it while grinding to keep the un-ground chunks moving into the blades for a more even grind.

Traditionally the dry meat was pounded into a powder using rocks. I’ve tried the pounding method using a hammer and a small blacksmith’s anvil. Unless you have a lot of time and need the exercise I don’t recommend it. It is a lot of work.



Weigh the amount of ground meat that you have and then weigh out an equal amount of rendered animal fat from the rendering process above. Fat from red meat animals is preferable for best nutrition and keeping qualities as it becomes very firm when cool – similar to candle wax. No vegetable oils or butter should be used. Pork or lamb fat can be used but are not recommended as the fatty acid profile is different and they melt at too low a temperature. This can cause the fat and lean to separate in warm weather, so storage becomes a problem unless you are willing to pack the pemmican in liquid tight containers.



Melt the fat on low heat. It will start to melt at about 120 deg F. Try to keep the temperature of the fat below 150 deg F. You spent time drying the lean meat at low temperature to maintain its nutritional value so you don't want to deep fry it when you mix it with the fat.



Mix the shredded meat into the melted fat and stir until well blended.



The completed mixture should look much like moist crumbled brownies. The mixture may look “wet” but most of the fat should be absorbed or coating the meat fibers – there should be little or no liquid fat pooling in the bottom of the pan.



Using a sturdy spoon, press the warm mixture into a mold of your choice, or spoon into a Ziploc plastic bag and press flat, removing as much air as possible. The grey colored molds above are mini loaf pans that are slightly larger than a cube of butter and hold about 150 grams (1000 total calories) of pemmican. The Ziploc bags are sandwich sized and are loaded with about 300 grams (2000 total calories). When pressed flat they are about 5” x 6” x ½” thick. Set aside to let cool and harden. The final product will be very hard – almost like a block of wax - and will look a bit like dark oatmeal with some ground raisins stirred in.

If you are using molds such as cupcake tins or loaf pans as above, the pemmican can be removed from the mold once it is hardened and then stored in plastic bags or wrapped in a grease proof paper. One convenient method I often use is to press the mixture into lined cupcake pans and then store the resulting hockey pucks with their paper liners in gallon sized Ziploc plastic bags. Each cupcake in a standard cupcake pan will hold about 75-80 grams (around 500 calories) if you pack them solid to the top.

If you want to keep your pemmican for any length of time, it should be stored in a dark place or wrapped in light tight paper or aluminum foil as well as placed in a plastic bag to keep out air and moisture. Pemmican does not require refrigeration and can be kept for years at room temperature as long as it is kept dry, and shielded from light and direct heat.

How Much Do I Need?

One half ($\frac{1}{2}$) pound of pemmican per day is about the minimum required for a sedentary adult and provides about 1,500 calories. Someone doing light activities might find $\frac{3}{4}$ pound more appropriate to their needs and this would provide about 2,200 calories. Twice this amount (or more) could easily be necessary when doing hard physical labor (think digging ditches or mountain climbing).

Pemmican is the perfect food for backpacking and hiking. Ten pounds of pemmican will easily sustain a backpacker for a full week providing $1\frac{1}{2}$ pounds of pemmican per day which would supply 4,400 calories – enough to support strenuous climbing at high altitude and in cold weather. The same 10 pounds of pemmican would supply food for two full weeks of leisure camping activities at $\frac{3}{4}$ pound per day providing 2,200 calories.

When made correctly, using grass fed lean red meat, dried at a temperature below 120 deg F., and rendered fat from grass fed animals, pemmican is a complete food and no other nutrients or supplements are necessary to completely meet all human nutritional requirements. No other single food is as calorie dense or nutritionally complete.

Lex Rooker
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