Dispelling the Meat-Dominated Myth: Alternative Food Sources in the Neanderthal Diet

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Abstract

Neanderthals are typically viewed as having a diet very high in lean meat. Biologically, a high lean meat diet lacks essential nutrients, namely vitamin C and can lead to loss of calcium and other detrimental effects due to excessive nitrogen. To complement such a diet, it is suggested that Neanderthals must have engaged in the consumption of non-animal foods that meet a variety of nutritional requirements. One such resource is the inner bark of trees, which contains calcium and vitamin C that would be deficient in a meat-dominated diet. In modern ethnographic examples of inner bark exploitation, such as that of the Sami people of northern Sweden, recommended daily intake of vitamin C could be met with 800 g of inner bark of Scots pine. Tools found at the Neanderthal site of Schöningen and Salzgitter-Bevenstedt parallel the bark peelers used by various indigenous groups. As an analogue to the tree species found in Paleolithic Europe, *Pinus strobus* inner bark was examined for palatability and yield per unit of time spent gathering. Other resources, such as wild edible mushrooms, slugs, and snails, were also examined for taste, macro/micronutrients, and availability. Both mushrooms (218 IU vitamin D) and bark (11.0 mg vitamin C) were readily available, and supplemented the diet with essential micronutrients unavailable from meat. The identification of alternative food sources can help reconstruct a more accurate and realistic Neanderthal diet that looks beyond the traditional meat-dominated hypothesis.

Introduction

Neanderthals are conventionally seen as consumers of cold-adapted mammals, and as a result of this carnivorous image, the role of other foods in the Neanderthal diet is often neglected. The meat Neanderthals were likely to have consumed would have an extremely small amount of fat. (Hardy 2009). This influx of protein leads to the organism reaching a protein ceiling, leading to death by what is known as “rabbit starvation” (Cordain 2000). Such a diet is not viable, and must have been supplemented with alternative foods.

Target Resources

The food sources examined were chosen based on availability in Paleolithic Europe, evidence of possible exploitation by Neanderthals, potential nutritional role in their diet, and availability for analysis in Gambier, OH.

Nutritionally viable foods are ones that fill dietary requirements that are not covered by the consumption of raw meat.

Inner Bark

Inner bark is a source of both calcium and vitamin C, micronutrients that are difficult to obtain in raw meat. The exploitation of inner bark is visible through ethnography, in the use of Scots pine (*Pinus sylvestris*) by the Sami people of northern Europe (Bergman 2004). Chisel-like modifications to bones found in Salzgitter-Lebenstedt are also indicative of bark peelers, especially in comparison to those found in ethnography (Sandgathe 2002).

Mushrooms

Mushrooms provide carbohydrates and are a good source of vitamin D, which is not readily found in meat. The main genus present in Europe are *Cantharellus (C.),* or the chanterelles (Pilz 2002), a main choice edible. There is evidence of Neanderthal exploitation, or at least the potential for it, in Weimar-Ehringsdorf where there are burnt remains of various foods, including mushrooms (Rolland 2004).

Snails

Snails provide micronutrients, as well as serve as a potential source of calcium; their shells are composed of calcium carbonate, and can be eaten to provide calcium. At sites such as Shanidar, there are indications that snails might have been consumed by Neanderthals, owing to the proximity of snail shells around Neanderthal remains (Solecki 1961).

	Calories (kcal)	Fat (g)	Carbohydrates (g)	Protein (g)	Vitamin A (IU)	Vitamin C (mg)	Vitamin D (IU)	Calcium (mg)	Magnesium (mg)
Neanderthal Upper Range (1)	5500 (4)	0 - 214	0 - 482	894 (5)	2970	90	200	1520	400
Neanderthal Lower Range (1)	3000 (4)	0 - 117	0 - 263	488 (5)	2970	90	200	1520	400
Food (per 100 g)	**Calories (kcal)**	**Fat (g)**	**Carbohydrates (g)**	**Protein (g)**	**Vitamin A (IU)**	**Vitamin C (mg)**	**Vitamin D (IU)**	**Calcium (mg)**	**Magnesium (mg)**
Snail (2)	90	1.40	2.00	16.10	---	---	---	10	250
Game meat, caribou (raw) (2)	127	3.36	0.00	22.63	---	0.00	---	17	26
Caribou, liver (raw) (2)	122	3.90	6.80	15.00	28800	0.00	---	4	---
Mushroom, chanterelle (raw) (2)	32	0.53	6.86	1.49	---	---	218	15	13
Inner bark, Cottonwood (3)	27	0.50	6.30	0.20	---	---	---	10	8
Inner bark, Scrub Birch (3)	---	---	14.00	3.10	---	11.00	---	---	---

Table 1: Maximum and minimum caloric requirements for Neanderthals, alongside select micronutrients (Note: raw meat provides for most other micronutrients). Below is the food examined and its nutritional information. Blank squares indicate unknown values. 1: Rinzler (2006), 2: USDA, 3:Sandgathe (2003), 4: Sorenson (2001), 5: Hardy (2009)

Figure 1: The three food resources exploited (from top to bottom): mushrooms obtained by foraging, slugs found through the use of a 1x1 meter sampling square, and inner bark obtained through the use of a bark scraper.

Methods

Each type of food was examined for nutritional content, overall yield, and palatability. All nutritional information was obtained from nutritional databases and published literature. Estimates of Neanderthal caloric intake span a range, so Table 1 reflects both a minimum and maximum value (Sorenson 2001).

Inner bark

The inner bark of the Eastern White Pine (*Pinus strobus*) was harvested at the Brown Family Environmental Center (BFEC) through the use of a handmade inner bark scraper. Various trees were sampled as to avoid causing long-lasting harm to any individual subject.

Mushrooms

Most mushrooms were found while walking the various trails on the BFEC. Mushrooms were collected in wax paper and examined for edibility through the use of field guides and spore prints. Most sampling occurred in the day, when visibility was optimal.

Snails

The search for snails consisted of deploying a 1x1 meter sampling square at various trails at the BFEC at night, preferably following a rainy period. Although no snails were uncovered, any slugs found were collected in a sealed container with air holes.

Figure 2: A hand-made bark scraper. Note the pointed tip used for bark removal.

Results

Utilization of a hand-crafted bark peeler made the inner bark of Pinus strobus readily available. The bark was easy to gather and is a palatable food source.

Of all the examined mushrooms, the only specimen that was found to be edible and was in a state to be eaten was the Golden Chanterelle (*Cantharellus cibarius*). Identification and collection were simple due to its distinctive appearance and growth in large clusters. Palatable both raw and cooked.

No live snails were located by sampling, although a few slugs were found. The species in question was the Yellow slug (*Limax flavus*). (Kerney 1979). There were too few slugs found to properly be examined for palatability. Because no snails were found, it was impossible to evaluate the shell as a dietary supplement for calcium.

Conclusions

Both inner bark and mushrooms can fill important dietary roles in Neanderthal food consumption. Inner bark provides vitamin C as well as calcium, while mushrooms provide vitamin D. More importantly, they provide calories from sources other than proteins, helping prevent rabbit starvation. Both are simple to exploit as well. The image of the top-carnivore Neanderthal is not a viable one due to micronutrient limitations of meat and health defects brought on by excessive protein consumption. An omnivorous model is more plausible due to nutritional supplementation from non-meat foods. It is likely that Neanderthals exploited many food sources, as opposed to utilizing meat exclusively.

Works Cited

Bergman, I., Ostlund, L., Zackrisson, O. 2004. The Use of plants as a Regular Food in Ancient Subarctic Economics: A Case Study Based on Sami Use of Scots Pine Innerbark. Arctic Anthropology, 41 (1), 1-13.

Cordain,L., Miller, J.B., Eaton, S.B. 2000. Plant-animal subsistence ratios and macronutrient energy estimations in worldwide hunter-gatherer diets. American Journal of Clinical Nutrition. 71, 682-92.

Hardy, B.L., 2009. Climatic variability and plant food distribution in Pleistocene Europe: Implications for Neanderthal diet and subsistence. *Quaternary Science Reviews* doi: 10.1016/j.quascirev.2009.11.016.

Huffman, D.M., L.H. Tiffany. 2008. Mushrooms and Other Fungi of the Midcontinental United States, second edition. University of Iowa Press.

Kerney M.P. and Cameron R.A.D., 1979, A field guide to the land snails of Britain and north-west Europe. Collins.

Pilz, David. 2002. Ecology and Management of Commercially Harvested Chanterelle Mushrooms. United States Department of Agriculture.

Richards, M.P., Pettitt, P.B., Trinkaus, E. 2000. Neanderthal diet at Vindija and Neanderthal predation: The evidence from stable isotopes. PNAS. 97 (13), 7663-7666.

Rinzler, C.A. 2006. Nutrition for Dummies, 4 Ed. Wiley Publishing Inc.

Rolland, Nicolas. 2004. Was the emergence of home bases and domestic fire a punctuated event? A review of the Middle Pleistocene record in Eurasia. Asian Perspectives: the Journal of Archaeology for Asia and the Pacific, 43: 248-280.

Sandgathe, D.M., Hayden, B., 2003. Did Neanderthals eat inner bark?. *Antiquity*, 77, 709-718.

Sorenson, M.V., Leonard, W.R. 2001. Neanderthal energetics and foraging efficiency. Journal of Human Evolution. 40 (6), 483-495.

USDA, 2010. United States Department of Agriculture Agricultural Research Service. 10 June, 2010. United States Department of Agriculture. <http://ars.usda.gov>.

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