

A Brief History of Barley Foods

C. W. NEWMAN AND
R. K. NEWMAN
Newman Associates, Inc.
Bozeman, MT

Barley is one of the oldest cultivated cereal grains and currently ranks fourth (7,21) or fifth (15) in acreage and crop production worldwide. In the United States, the current use of barley as food ranks a distant third (1.5%) behind use as animal feed (65%) and in malt and alcohol production (30%). In 1991, barley used as food in the European Union (12 countries) was even lower (0.3%) than in the United States. In contrast, during the same time period food was the largest use for barley in Morocco (61%), China (62%), India (73%), and Ethiopia (79%) (15).

A small portion of barley malt is used in food products principally to enhance flavor; however, the major use of barley malt is in the production of alcoholic beverages. Although alcoholic beverages are not foods in the strictest sense, they do contribute some nutrition, either with or apart from meals, to the diet.

Considerable evidence is available that points to the role of barley as a sustaining food source in the evolution of humans. Indeed, it was one of the most important food grains in the ancient world. Additionally, alcoholic beverages of various types and fermented foods prepared from barley are commonly referred to in the ancient literature. As other food grains (e.g., wheat, rye, and oats) became more abundant, barley was relegated to the status of “poor man’s bread” (31). However, current consumer interest in nutrition and health may help restore barley’s status in the human diet.

This article provides some historical perspectives on the origin, domestication, and food uses of barley. Our knowledge of barley’s prehistory comes from archaeological studies of ancient civilizations. It is generally accepted as fact that the trans-

formation of wild barley into a cultivated crop (domestication) occurred over many millennia (31). Fragile ears, a characteristic of wild barley, made it difficult to harvest seeds at maturity. It has been postulated that natural mutations in wild barley produced plants with less fragile ears that had larger, more abundant seeds that were naturally preferred and selected for food by hunter-gatherers. One may logically conjecture that agriculture began when seeds from these plants were planted, either accidentally or intentionally, producing a “barley crop.”

The first barley foods probably were quite simple. The kernels were eaten raw until the discovery that removal of the hulls of hulled types followed by soaking and/or cooking in some manner enhanced the texture and flavor. It is also logical to conclude that this may have been when early humans learned about fermentation and how to produce alcoholic beverages.

Origins of Barley Cultivation

Archaeologists and other scientists who have attempted to reveal more of the historical development of humans and their attempts at cultivating barley do not conclusively agree on exactly where these events occurred. The currently accepted theory is that barley was first domesticated in the Fertile Crescent in the Near East, which spans present-day Israel, northern Syria, southern Turkey, eastern Iraq, and western Iran (11). The ancestor of modern barley is believed to be identical to present-day *Hordeum spontaneum* C. Koch (11,12,30,31).

Ancient texts from many cultures in Asia, Africa, and Europe refer to barley as an important dietary constituent. The earliest remains of barley so far discovered in archaeological sites, dating from around 8000 B.C., were those from the Bus Mordeh phase of Ali Kosh, near Deh Luran in Iran and Tell Mureybat in Syria. Wild wheat was also found in these sites, although as in other sites in Syria, Palestine, Mesopotamia, and Asia Minor, barley was the more abundant of the two cereals. From available evidence, barley appears to have been grown on a considerable scale by 7000–6500 B.C. at Jarmo in the Iraqi piedmont, and large amounts of two-rowed,

hulled barley remnants have been unearthed at Beiha, north of Petra in southern Jordan. Six-rowed hullless types appeared at Ali Kosh and two Anatolian sites, Hacilar and Catal Huyuk, dating from 7000 to 6000 B.C. (11).

Agriculture spread from western Asia, following Neolithic migrations south and west to North Africa, north and west through Asia Minor to Europe, and eventually east to the valley of the Indus (4). Archaeologists have found a clay tablet from ancient Sumer in Lower Mesopotamia dating from around 2700 B.C. that provides a prescription for a poultice that includes dried powdered herbs and fruit blended with barley ale and oil. The Sumerian scribes also describe the correct method of planting barley (16). Similarly, a small fragment of pottery with cuneiform script dating from around 1700 B.C. was found at Nippur (Egypt) that describes recommended irrigation practices for growing barley and the deleterious effect of too much moisture (16).

The basic foods of the Sumerian diet were barley, wheat, millet, lentils, pulses, beans, onions, garlic, and leeks. Sumerians were also fond of alcoholic beverages: they developed eight kinds of ale made from barley, eight from wheat, and three from grain mixtures (26). Perry (24) relates a curious ancient recipe from the medieval Arab culture that involves putting unleavened and unseasoned barley dough into closed containers and allowing it to “rot” (ferment) for 40 days. The dough was then dried, ground into meal, and blended with salt, spices, wheat flour, and water to make a liquid condiment called *murri* (when mixed with milk, it was called *kamakh*).

North Africa

Both barley and wheat foodstuffs were utilized by Egyptians during the early Neolithic period, and breads and porridges were common daily fare. In Egyptian literature, barley (it) is mentioned as early as the first dynasty and is often referred to as barley of “Upper Egypt” or “Lower Egypt” and as white or red barley. During this period, a common ale (haq) with a low alcohol content was made from “red barley of the Nile” (5).

Barley was intimately entwined in Egyptian religious rites and celebrations. It was used as an offering to the gods, in funerals, and even became a part of Egyptian legends. Apart from these uses and as a food source in general, barley was used in brewing, a medium of exchange, and in therapeutic applications. Barley was used widely in medicinal applications in ancient Egypt and was prescribed in different forms for various maladies. Ground barley preparations, usually mixed with oil, were used as purgatives, applied to wounds to decrease healing time, used as anal suppositories, and used to remove phlegm and treat eye diseases. Perhaps most impressively, barley was used as a diagnostic agent for pregnancy and to determine the sex of unborn children (5).

The Oromo, an ethnic Ethiopian people, incorporate barley into their lifestyle following cultural practices that date back thousands of years. According to Haberland (10), barley was the only crop grown by the Oromo in ancient times. Among the Oromo and other people in Ethiopia, barley was considered the holiest of all crops. Their songs and sayings often include references to barley as the “king of grains.” People in the highlands of Ethiopia encouraged their children to consume lots of barley, believing that it made them brave and courageous. Raw or roasted unripe barley was a favorite food of children (2), a tradition that continues in modern times (19). In Oromo society, special systems, practices, and traditions that involve barley foods and beverages have been maintained for at least the last 400 years. Barley porridge (*merqa* and *kinche*) and fermented and unfermented barley beverages of various consistencies (*tella*, *zurbegonie*, *bequire*, *borde*, and *arequie*) are central to prosperity, harvest, and marriage rituals. The Oromo were originally a nomadic people, and it has been suggested that the development of barley as a crop made an immense contribution in transforming these nomads into a settled farming society by making their life more secure (19).

Europe

With movement of civilizations from the Fertile Crescent and the initiation of agricultural trade routes, barley use and cultivation spread throughout the European continent. Barley was a common constituent of unleavened bread and porridge eaten by the ancient Greeks. Pliny the Elder during a visit to Egypt witnessed the use of barley in medical treatments and brought the knowledge to Greece. He is quoted as saying that consuming barley would heal stomach ulcers. Hippocrates is also quoted as stating that barley water gave strength and health. Pliny described recipes for barley *puls*, an oily, highly seasoned paste mixture that was a popular food in ancient Greece (26). A bread roll claimed by Archestratus in the 5th century B.C. to be the “best barley” was prepared in Lesbos and Thebes by “rounding

the dough in a circle and pounded (by hand)” prior to baking. This bread was called *krimnitas* or *chondrinos*, which are terms describing coarsely milled barley (17). A twice-baked barley biscuit called *paximadia*, a favorite Greek food item, was soaked in broth prior to eating. In more recent times in Greece, a combination of barley and wheat flour has been used to produce lighter, crunchier biscuits that do not require soaking before eating. Barley was not fully accepted by all Greeks, however. Aristotle, as well as bakers in more cosmopolitan communities such as Athens (where breads were prepared by professional bakers), thought it to be less healthy than wheat (17).

Although barley was considered a respectable, even desirable, food in parts of ancient Greece and Italy, Roman soldiers came to look on barley as “punishment rations,” even though barley malt was highly regarded by the army for making an alcoholic beverage (6). In ancient Rome, bread made from wheat was considered more nourishing, more digestible, and in every way superior to barley bread. As in later cultures, barley bread (*panus hordeaceus*) was consumed predominantly by slaves and the poor. After the fall of the Roman Empire, barley bread was considered inferior to rye and wheat breads. However, rich citizens did use barley bread as “trenchers” or plates. Barley was also the general food of Roman gladiators, who were

called *hordearii* or “barley men.” They believed that barley bread gave them greater strength and increased stamina compared with other foods (23).

Barley has been widely cultivated in the Caucasus Mountains of Eastern Europe for thousands of years (23). Fossilized barley plants that appear to be hullless types have been found in ancient settlements near the village of Ghiljar in the eastern part of the region. In the Caucasus Mountain districts above 1,700 m, barley was the only grain crop cultivated as a food source by ancient inhabitants. Most of the barley grown was hullless and was used to make flat cake and soup. A product capable of being stored, called *ini*, was made by frying hullless barley kernels on a special brazier, then grinding and storing the product in a large earthenware vessel. *Ini* could be stored for many months, requiring only the addition of water and salt for preparation. The resulting barley dough was then rolled into a ball and was ready to eat. Although not necessary and used only if available, butter and/or cheese sometimes were added to the mixture prior to eating. A beverage containing about 4% alcohol, called *buza*, was a traditional drink made from fermented hullless barley cakes and malt (23).

Barley reached Spain in the 5th millennium B.C. and spread north through what is now France and Germany. According to

An advertisement appeared here
in the printed version of the journal.

Davidson (6), an ancient barley bread survives in Jura, a mountainous region of France. This bread, called *bolon* or *boulon*, is prepared in small loaves that are very hard and require soaking in milk or water prior to eating. Hulless, six-rowed barleys were introduced to the British Isles from the European mainland by around 3000 B.C. (4). Bread made from barley and rye flours formed the staple diet of the peasants and poorer people in England during the 15th century A.D. (14). Oats have long been thought of as the chief element of the Scots diet, but in fact, at the beginning of the 18th century a mixture of barley, peas, and beans was a common food, especially for the poor. Oats were the “rent-paying” crop in Scotland, thus barley was the cereal eaten by most rural Scots (9). It was said in early literature that Scottish land tenants “eat nothing better than barley meal and a few greens boiled together at midday and barley meal porridge at evening and morning.”

In the Orkney and Shetland islands off the northern coast of Scotland, a variety of food barley called bere was very popular for milling into flour for more than a thousand years. Bere is a six-rowed landrace variety adapted to growing in acid soils and to short growing seasons. It is thought to have been introduced to the islands by Norse or Danish invaders in the 8th century A.D. (13), although carbonized barley kernels of hulled and hulless types recently excavated in Shetland have been dated to around 1560 B.C. Oats were first grown on the islands during the Iron Age, along with barley. These two grains remained the standard grain crops for many years and were cultivated by the Vikings (8). Flour milled from bere barley traditionally was used for making bannocks and other breads and pastries. Scottish mills were adapted not only for oats but also for grinding of bere and pulses, either separately or as a mixture. The resulting mixed meal was made into coarse bread, flat and unleavened, or into porridge. A water-powered mill near Kirkland in the Orkneys still produces bere barley meal. Bere that had been *knockit* (roughly pearled) and left whole was used to make barley broth. Scotch broth or barley broth, a well known traditional broth, was prepared by boiling beef and barley and adding a variety of vegetables and a little sugar. Scottish *marshlum*, a mixture of peas, beans, and bere barley or oats, was still eaten by all classes until the end of the 18th century and by workers after that in some lowland areas. A mixture of peas and barley meal known as “bread meal” was sold by a grain mill at Perth as late as 1837. The popular scone served at tea in the United Kingdom originally was made from bere barley meal or a mixture of bere barley meal and oat meal. Scone, a Scottish word, may be derived from *schoonbrot* or *sconbrot*, meaning white bread (9).

According to Mikelsen (18), hulless barley and einkorn were introduced into Norway between 2000 and 1700 B.C. Of the

two grains, barley was far more commonly grown, probably because it was more winter hardy. On the island of Senja in Troms in the far northern part of Norway, a porridge called *vassgraut* (water porridge) was a common food made by adding ground barley to boiling water. In the Viking era, “ash bread” was prepared by baking barley dough in hot ashes. In addition, it was common to bake barley flatbread on a type of griddle over a fire.

Barley was grown extensively in Scandinavia during the Bronze Age (around 2000 B.C.), because wheat of that era was more difficult to grow in the cold climate (20). During the Bronze Age barley became the major cereal used for food in Scandinavia, a tradition that continued until the 20th century in many parts of Northern Europe. A common diet at the beginning of the 20th century in Lunede (Denmark) on the island of Fyn included porridge of barley grits cooked in milk or beer (morning); meat broth with abraded barley (noon); and barley grits cooked in sufficient amounts to provide for breakfast the next day as well (evening).

Perhaps the first clinical trial with barley was reported by L. M. Hindhede in his book *Fuldkommen Sundhed og Vejen Dertil*, in which two adult men were fed a diet based on barley grits, margarine, and sugar for 180 and 120 days, respectively (20). The first subject was involved in heavy manual labor and lost 3.5 kg of weight during the first 36 days of the 180-day period but was otherwise in good health at the end of the study. The second subject, who was in poor health initially, complaining of chronic stomach problems, gained 9 kg during the 120-day period and made the following proclamation: “I have now lived on barley porridge for the last four months. As well as having completely recovered my health, I have gained 9 kilos.”

Flatbreads made from barley meal were common in Sweden; the loaves were dried and kept up to 6 months as a staple food. In the Faroe Islands, dough balls made with milled barley were first placed on an open fire to form a crust, and the baking was completed by placing crusted barley dough balls in warm ashes. This ancient type of bread was called *drylur*. Abraded barley kernels and barley grits were used in many foods, including soups, porridges, meat blends, sausages, and blood mixtures and, in many instances, were blended with legumes and other cereals. In Dalarne, Sweden, pea meal and oats were commonly blended with barley meal for baking. Sour beer was often used in food preparation, especially in baking barley or mixed-grain breads (20).

East Asia

As was the case with the spread of barley into North Africa, the Mediterranean region, and Europe, barley cultivation rapidly moved to the east of the Fertile Crescent through the trade routes into many parts of Asia,

reaching Tibet, China, Japan, and India in the 2nd and 3rd millennia B.C. (6).

Barley has been and continues to be a mainstay in the diet of the Tibetan people. For many years the Tibetan diet consisted mainly of two food items, *tsamba* and yak butter tea. To make *tsamba*, barley was parched, ground into very fine flour, and made into flat cakes. Butter tea was made from a strong Chinese tea that was strained into a churn and to which varying amounts of stale butter and salt were added. The mixture was then churned into an emulsion. After drinking some of the tea, *tsamba* was added, kneaded into lumps, and eaten. *Tsamba* could be taken on journeys and eaten dry or with some type of liquid, such as water or milk (25).

An important and early center of agriculture in the subcontinent of India was in the Indus Valley, now mainly Pakistan. Wheat and barley were staple foods of the Harappan civilization, which flourished in this general area from around 3200 to 2200 B.C. Ajgaonker (1) describes how ancient Indian physicians effectively stabilized type II diabetics some 2,400 years ago. The treatment was remarkably simple and not really different from recommendations that are given to diabetic patients today, i.e., lose weight, change diet, and increase exercise. In the case of diet, the major changes were reduced caloric intake and substitution of barley for white rice.

Barley has been grown in Korea for many years and in the southern part of the peninsula as a rotation crop with rice; the latter was planted in the summer season, while barley was planted in the winter season. It is believed that barley was first cultivated in Korea around 100 B.C. (3). Although rice is the favorite cereal of Koreans, barley was used as an extender in many rice recipes, especially during periods during which rice was in short supply. Various milling procedures, such as splitting the kernel at the crease to decrease cooking time and to make the barley kernel more similar in size to the rice grain, have been used in the past. In the Korean language, cooked cereal, which is usually rice, is called *bob* and mixed *bob* is prepared by cooking rice and precooked barley as a mixture. *Bori* is the Korean word for barley, and when only barley is used for *bob*, the dish is called *kong bori bob* (Byung-kee Baik, *personal communication*). Barley malt also has been used to prepare a traditional sweet drink, and in some instances, barley has been used in the preparation of fermented soybean paste as well as hot pepper paste (Byung-kee Baik, *personal communication*).

Barley tea has a long history in Asia and is still in many parts of the continent, including Korea, China, (especially Tibet), Japan, and India. Barley tea is prepared from roasted barley kernels that are steeped to make a mild nonalcoholic drink that is consumed both hot and cold, with and without meals, like water. In the past the kernels were pre-

pared at home for use in tea. Today, however, roasted kernels for making barley tea are available in many food stores in modern cities and towns in Asia. There are many anecdotal references to the medicinal value of barley tea throughout the literature. In a section titled, "Recipes for the Sick" in *The Rumsford Complete Cookbook* (28), a recipe for barley water for the sick is given as follows: 2 Tbsp of pearl barley, 1 qt of cold water, 1/3 tsp of salt, juice from half a lemon, and a little sugar; soak washed barley, add salt, and cook about 3 hr; strain through cheese cloth; and flavor with the lemon juice and sugar as desired.

North America

Columbus brought barley to the North American continent in 1494 on his second voyage (27). The original introduction site was not conducive to barley culture, and there were no further reports of production in the area. Later, there were two additional pathways through which barley was introduced more successfully in North America. Barley was brought to the East Coast colonies from England at the turn of the 17th century and into the Southwest during the Spanish mission movement (29). There is little or no indication that barley was used for food during these early years; most of the crop was grown for malting, and the remainder was used as animal feed. The same pattern continues today in the United States, with the majority of barley used for animal feed (65%) and malt and alcohol production (30%), and the remainder consumed as food (1.5%) or used for other purposes (15).

References

1. Ajaonker, S. S. Diabetes mellitus as seen in the ancient Ayurvedic medicine. Pages 13-20 in: *Insulin and Metabolism*. J. S. Bajaj, ed. Association of India, Bombay, 1972.
2. Asfaw, Z. An ethnobotanical study of barley in the central highlands of Ethiopia. *Biol. Zentbl.* 109:51, 1990.
3. Bae, S. H. Barley breeding in Korea. Pages 26-43 in: *Proc. Joint Barley Utilization Semin.* Korea Science and Engineering Foundation, Suwon, 1979.
4. Clark, H. H. The origin and early history of the cultivated barleys. *Agric. Hist. Rev.* 15:1, 1967.
5. Darby, W. J., Ghalioungui, H., and Grivetti, G. *Food: The Gift of Osiris*. Academic Press, New York, 1976.
6. Davidson, A. *The Oxford Companion to Food*. Oxford University Press, Oxford, 1999.
7. Fedak, G. Intergeneric hybrids with *Hordeum*. Pages 45-70 in: *Barley: Genetics, Biochemistry, Molecular Biology and Biotechnology*. P. R. Shewry, ed. CAB International, Wallingford, England, 1992.
8. Fenton, A. Grain types and trade. Pages 332-336 in: *The Northern Isles: Orkney and Shetland*. Tuckwell Press, East Lothian, Scotland, 1978.
9. Gauldie, E. Diet—The product of the mill. Pages 1-21 in: *The Scottish Country Miller 1700-1900: A History of Water-Powered*

Meal Milling in Scotland. John Donald Publishers Ltd., London, 1981.

10. Haberland, E. *Völker Süd-Äthiopiens*. Vol. 3: *Galla Süd-Äthiopiens*. Kohlhammer Verlag, Stuttgart, Germany, 1963.
11. Harlan, J. R. On the origin of barley. Pages 10-36 in: *Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests*. USDA Agric. Handb. No. 338, 1979.
12. Harlan, J. R., and Zohary, D. Distribution of wild wheats and barley. *Science* 153:1074, 1966.
13. Jarman, R. J. Bere barley—A living link with the 8th century. *Plant Var. Seeds*. 9:191, 1996.
14. Kent, N. L. Barley. In: *Technology of Cereals*. 3rd ed. Elsevier Science Ltd., Oxford, 1983.
15. Kent, N. L., and Evers, A. D. *Kent's Technology of Cereals*. 4th ed. Elsevier Science Ltd., Oxford, 1994.
16. Kramer, S. N. *History Begins at Sumer*. Doubleday and Co., New York, 1959.
17. Kremezi, A. Paximadia (barley biscuits): Food for sailors, travellers, and poor islanders. In: *Food on the Move: Proc. Oxford Symp. Food Cookery 1996*. H. Walker, ed. Prospect Books, Devon, England, 1997.
18. Mikelsen, E. *Korn er Liv*. Statens Kornforretning, Oslo, 1979.
19. Mohammed, H. The Oromo of Ethiopia 1500-1850 with special emphasis on the Gibe Region. Ph.D. thesis. University of London, London, 1983.
20. Munck, L. Barley as food in old Scandinavia especially Denmark. Pages 386-393 in: *Barley: Proc. 4th Reg. Winter Cereal Workshop*. Vol. 2. Amman, Jordan, 1977.
21. Nevo, E. Origin, evolution, population genetics and resources for breeding of wild barley, *Hordeum spontaneum*, in the Fertile Crescent. Pages 19-43 in: *Barley: Genetics, Biochemistry, Molecular Biology and Biotechnology*. P. R. Shewry, ed. CAB International, Wallingford, England, 1992.
22. Omarov, D. S. Barley for food in mountainous Caucasus. Pages 192-200 in: *Barley for Food and Malt: ICC/SCF Int. Symp.* Swedish University of Agricultural Sciences, Uppsala, 1992.
23. Percival, J. *The Wheat Plant*. Duckworth Publishers, London, 1921.
24. Perry, C. A nuanced apology to rotted barley. In: *Petits Propos Culinaires*. Prospect Books Ltd., London, 1983.
25. Shelton, A. L. Life among the people of eastern Tibet. *Natl. Geogr. Mag.*, p. 295, April, 1921.
26. Tannahill, R. *Food in History*. Rev. ed. Penguin, London, 1988.
27. Thacher, J. B. *Christopher Columbus. His Life, His Work, His Remains*, vol. 2. G. P. Putnam's Sons, New York, 1903.
28. Wallace, L. H. Barley water. Page 222 in: *The Rumsford Complete Cookbook*. The Rumsford Co., Rumsford, RI, 1930.
29. Wiebe, G. A. Introduction of barley into the New World. Pages 1-9 in: *Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests*. USDA Agric. Handb. No. 338.
30. Zohary, D. The progenitors of wheat and barley in relation to domestication and agricultural dispersal in the Old World. Pages 47-66 in: *The Domestication and Exploitation of Plants and Animals*. P. J. Ucko and G. W. Dimbleby, eds. Duckworth, London, 1969.
31. Zohary, D., and Hopf, M. *Domestication of Plants in the Old World: The Origin and Spread of Cultivated Plants in West Asia, Europe, and the Nile Valley*. Clarendon Press, Oxford, 1988.

The Authors



C. W. (Walt) Newman received his Ph.D. degree in animal science at Louisiana State University in 1965. He joined the faculty at Montana State University in 1964 and retired as professor emeritus in 1996. His major work during his academic career at MSU was in research exploring the food and feed value of barley as affected by genetics, environment, and the genetic-environment interaction. The most significant accomplishment of his career was the demonstration of the cholesterol-lowering effect of barley β -glucan in animal and human subjects. Newman continues to be an ambassador for barley through his consulting, publishing, and assistance to other scientists in the field.



R. K. (Rosemary) Newman received her Ph.D. degree in nutritional sciences at Rutgers and joined the Montana State University faculty in 1977. Prior to receiving her degree, she worked as a registered dietitian in hospitals, institutions, and public health. In addition to teaching nutrition courses at MSU, her research focused on the effect of barley fiber on lipid metabolism. She retired as professor emeritus in 1996 and continues to practice as a dietitian and certified diabetes educator. As with Walt, she is an ambassador for barley and is currently preparing a new barley cookbook.