

Grains and Flours of Medieval England
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**He had corn carried
and a merry feast made.**

-King Horn, a 13th century romance

Over the last several years I have researched and recreated medieval pastry and pies. Through this work, I have found myself increasingly pulled to research grain history and archeology. In this paper I will present some of my findings thus far, including the social and cultural significance of grains in the medieval English diet, types of grains that were grown historically (including wheat varieties), and my experiences with using some modernly available flours milled from heirloom grains. The primary source evidence I have drawn from is limited to England between about 1270 and 1400, and thus I consider my conclusions to only apply to that particular time and place. However, it is my hope that the research I have done will inspire others to explore what records are available for other time periods and places.

Social and Cultural Significance of Grains

Across social groups, the English diet was based on grains. In the 13th century, up to 80 percent of a harvest-worker's calories came from grains; for a soldier, 78%; and for the lay nobility, 65-70% (Stone). Ale, porridge, pastries, and a variety of breads made from differing blends and qualities of grains were eaten, with specific types of bread consumed by specific social strata. In England, the climate and soil in most parts of the country made growing wheat difficult, so other grains -- barley, oats, and rye, as well as legumes -- were more widely grown. Products made exclusively from wheat flour were the most expensive and the most desirable, and thus were limited to high-status contexts. By contrast, the bread and porridge consumed by the lower classes were made from other crops, typically blends of grains that were grown and milled together, such as maslin (mixed rye and wheat) or bulmong (oats, peas, and beans). The significance of grains in the English diet is confirmed by the Assize of Bread and the Assize of Ale, introduced during the thirteenth century to regulate prices (Halsall), as well as the frequency of laws and ordinances regulating quality of bread and ale. Understanding the grains available, and their properties, is critical to understanding medieval English foodways.

The Contents of Medieval English Fields

Medieval English recipes frequently mention, grains, legumes, and products made from them. In working with 13th and 14th century English recipes, I have come across references to flour, white flour, wheat starch, bread (usually bread crumbs), wastel bread, sourdough (as a leavening agent), rice and rice flour, oatmeal, peas, and beans, as well as non-grain flours such as almond flour and chestnut flour. While this gives us a glimpse into some of the foods available to the medieval cook, it is far from a complete picture. A central problem with relying on written records for food history is survival bias -- all of the medieval recipes we have were written for a very specific audience, and can at most only provide us with information about food available to the elite. Furthermore, even within elite contexts medieval recipes provide only a loose framework for the would-be modern medieval cook: what did a medieval cook's "white" flour look like, and how did it perform in recipes?

Archeological data can provide some additional clarification. Plant remains (predominantly seeds) from grains and legumes found at six sites (Leicester, Chester, Upwich, Beverly, Newcastle,

and Bristol) dating from the 11th through 15th centuries included rivet wheat, bread wheat, additional unspecified or unidentified wheat varieties, barley, rye, common oat, broad beans (fava beans), and field peas (Moffett). Going deeper, a significant source of information on medieval cereal crops is blackened roof thatch from standing medieval buildings. Layers of soot-blackened thatch survive on some medieval English buildings dating from the medieval period (specifically the 14th and 15th centuries) and John Letts (see sources) has examined over 200 samples, all originating from the South of England and most coming from Devon. (Typically roofs in the north of England were thatched with water reed or sedge [Ambrose and Letch].) These samples have preserved not only grain-bearing plants (with both the ears and straw intact), but also crop weeds and other vegetables. These roof samples provide us with a glimpse into complete medieval fields, and allow us to see how crops changed over time. One striking finding is the diversity of crops within a medieval field:

Most samples contain 'landrace' mixtures of bread wheat (*Triticum aestivum*), English rivet wheat (*Triticum turgidum*) and rye (*Secale cereale*) which grew to 6ft (1.8m) or more in height - far taller than modern varieties - as well as barley (*Hordeum vulgare*) and oats (*Avena spp*). Land races evolve over many centuries when crops are grown in heterogeneous conditions, year after year, from seed saved from the previous year's crop. The result is that every plant in a landrace is slightly different from its neighbour, and medieval cereals were consequently very uneven in straw height, ripening time, grain yield and other agronomic traits. This diversity ensured that a portion of the crop almost always set seed irrespective of the many environmental stresses that can destroy a crop such as drought, waterlogging, frost or crop disease. (Letts)

As many of the roof samples are composed of threshed straw and threshing waste, it is reasonable to conclude that these samples accurately reflect food crops. Within this threshing waste additional plant taxa are found, including legumes such as broad beans and field peas as well as numerous weed species, again indicating that medieval fields were significantly more diverse than modern fields. It is possible that seeds from some of these plants may have been milled along with the wheat grains, although the impact on the finished flour would presumably be negligible. (ibid)

Modern wheat (and other cereal grains) are grown as monocultures, vastly different from the diversity of medieval fields. The stark reality is modern wheat bears very little resemblance to its medieval ancestors (for discussion of genetic changes in wheat over time, see Haudry et al and Peleg et al in sources). The number of wheat varieties grown in the UK has dropped precipitously since World War II (Ambrose and Letch): in the 1830s, some 150 named wheat landrace varieties were described, and in the 1920s and -30s 63 wheats from across the UK were collected, classified, and catalogued. But by 2003, only three landraces were recorded (specifically as being grown for thatching). (ibid) Typically early landraces referenced place names, and it is highly likely that each region in England had a unique wheat variety historically.

Wheat Varieties

Although medieval records differentiate between types of crops (e.g. wheat vs. rye), they do not differentiate between varieties within a crop. For example, wheat is universally referred to as *frumentum* in manorial records of the period (Stone). The archeological evidence described above suggests that both rivet wheat (*T. turgidum*) and bread wheat (*T. aestivum*) were grown together and may have been considered to be a single crop. This tends to support the idea of landrace wheat; people simply used whatever wheat was available to them rather than using individual varieties

purposefully. Where this gets tricky for the would-be medieval cook is in the question of bread wheat varieties.

The major distinction between modern wheat varieties is between hard red and soft white wheat. Hard red wheat is higher in gluten and preferred for bread baking, while soft white wheat is higher in starch and is preferred for, among other things, pie crusts. While most secondary sources suggest that only soft white wheat was available in the medieval period, I have not found definitive confirmation of this. Archeological studies simply say “bread wheat” without specifying a variety (and variety may not be distinguishable in extant plant remains). We know that wheat was grown as a winter crop mediievally; labors of the months typically include plowing and sowing in the fall. However, both hard red and soft white wheat are winter crops (although there is also a spring hard red wheat).

Even when late medieval or post-medieval texts describe particular varieties of different cereal crops, it is essentially impossible to correlate these characteristics with modern varieties (Moffet). By the very end of the 16th century, John Gerarde in his *Herball* mentions white wheat, red wheat, and flat wheat by name; from the description and its accompanying picture flat wheat may refer to rivet wheat. It is not clear if the white and red wheat of Gerarde correspond to the varieties of the same names of today, or if they do when these varieties appeared.

Bread wheat was selectively bred from older wheat species such as einkorn, emmer, and spelt. I thought it would be interesting to compare macronutrient data from these types of wheat to potentially gain some insight into which characteristics of bread wheat are more likely to be ancestral rather than recently derived. My findings can be seen in table 1. All data are from the USDA unless otherwise specified.

Table 1: Macronutrient data from various wheat species.

| <i>All values are per 100g</i> | Einkorn* | Emmer** | Spelt | Soft White | Hard Red |
|--------------------------------|-----------------|-------------|-------|------------|----------|
| Water | <i>N.D.</i> | <i>N.D.</i> | 11.02 | 10.42 | 13.10 |
| kCal | 347 | 362 | 338 | 340 | 327 |
| Protein*** (g) | 18.2 | 12.77 | 14.57 | 10.69 | 12.61 |
| Total lipids (g) | 2.48 | 2.13 | 2.43 | 1.99 | 1.54 |
| Carbohydrate (g) | [65.5 g starch] | 72.34 | 70.19 | 75.36 | 71.18 |
| Fiber (g) | 8.7 | 10.6 | 10.7 | 12.7 | 12.2 |
| Sugars (g) | 2.67 | <i>N.D.</i> | 6.82 | 0.41 | 0.41 |

*No USDA data available. Data given are from www.einkorn.com/wp-content/.../Grain-Nutrition-Comparison-Matrix.pdf.

**No USDA data available. Data given are from <http://www.bluebirdgrainfarms.com/nutritional-information.html>

***Total, so includes both gluten and other proteins.

It is interesting to note that all of the “ancient” wheat varieties (as they are grown today; these are not living fossils, but modern crops that have certainly undergone evolutionary changes from their ancestral forms) contain a greater amount of protein even than modern hard red wheat. However, the gluten content in historical grains is said to be lower than the gluten content in modern wheat, as breeding wheat to contain more gluten (for better bread baking) has been a major aim of industrialized agriculture. Spelt in particular is generally considered poor for bread baking by modern bakers. This suggests to me that medieval bread wheat would have tended to have less gluten than modern hard bread wheat. I was unable to find macronutrient data on rivet wheat (*T. turgidum*), but I did find a reference to it being “better suited to biscuit- than to bread-baking” (Hamerow et al) which suggests a relatively low gluten to starch ratio.

Although I have not found definitive primary source evidence for medieval bread wheat varieties, I believe it is safe to conclude that 1) even if different bread wheat varieties did exist in the medieval period, they seem to have not been selectively grown for specific purposes; medieval cooks did not have separate flours for bread baking and pastry baking; and 2) in general, medieval flour was likely poorly suited to bread baking, tending to suggest it was more similar to modern pastry flour (from white wheat).

A Note on Milling and Processing

Just as bread was produced exclusively by professionals, in High Medieval England flour was exclusively ground by professional millers with water-, animal-, or wind-powered mills. The heterogeneous mix of grains from one field would be harvested, threshed, and milled together. Millers kept a share of the flour they milled, and the mill was owned by a landowner (the lord) who charged for the use of it. In general, grain stores better than milled flour; while I have not yet fully researched this, it is my general opinion that flour was milled fairly close to the time of use. Pure wheat flour could be further processed to yield an even more refined and desirable product: the bran would be hand sifted out using a sieve or the flour would be “bolted” through successively finer cloths. The final product was the white flour specified in medieval recipes, although this would have been significantly different from modern bleached white flour.

Where to Buy Medieval Flour in a Modern World

I have found a modern producer of what is essentially a recreation of medieval (and renaissance) flour. John Letts runs a small specialty farming and milling operation called Lammas Fayre that grows and mills mixed heirloom grain crops. Some flours are sieved to yield white flour in the same manner as would have been done medievally. These flours are (as of now) only available from a UK company called Bakery Bits (see works cited).

Lammas Fayre offers several different varieties of flour; I have ordered and tested some of these in medieval baked goods (mostly pie crusts). Overall I have found that these flours are significantly different from modern flours. They smell and feel different, and none of them make fluffy breads. As a pastry maker, I have fallen in love with these flours; they do not fight you the way even soft white wheat flour will. The company offers flour “blends” that correlate to the types of flours available historically. Here are some of my comments on these flour blends; each is suitable for its own cooking niche.

Medieval Peasant's Blend: A mix of wheat, rye, barley, oats, broad beans, and peas. This is a wholemeal flour, meaning it has not been bolted/sieved, and the blend of crops is in line with general trends in peasant grain consumption. If you are recreating bread produced for certain types of servants or household employees, eaten by peasants, or the least expensive bread available from professional medieval bakers, this is a perfect option. I have made some delicious long-fermented sourdough loaves from this -- the crumb is very dense, but this bread is hearty enough to sustain you in a way that typical modern whole grain bread cannot match. I would not use this to recreate recipes out of extant medieval culinary manuscripts, as those are all from high-status contexts. One of my students used this to make pie crust for plausible peasant pies, and it was excellent.

Maslin Blend: A blend of multiple wheat and rye varieties grown together then stoneground and sieved. Maslin bread was most likely consumed by an incredibly broad spectrum of the population, including peasants, workers and other town-dwellers, servants in manor households, and was used by the gentry for trenchers (Hammond). I am curious if Letts / Lammas Fayre has research to support the sieving of maslin, as that is not something I have ever seen reference to; in all of my research, the only type of flour to undergo bolting was pure wheat flour in high-status contexts. While I would not use maslin to recreate high-status food, this flour is perfect for

recreating foods of many other groups as described above. This flour bakes a tasty if dense loaf of sourdough bread, and performs fine in pie crusts (consider this as an option for recreating the pies sold by cookshops in urban areas, which were a stable “fast food” of the medieval period).

Norman Blend Rivet Wheat Flour: This sieved flour is a mix of a large number of rivet wheat varieties. This flour is, as far as I have been able to determine, the only commercially available rivet wheat flour. Given the significance of rivet wheat in medieval English fields, I was really excited to find this. However, based on my research rivet wheat was not grown separately from bread wheat, so I think this is more of a novelty than a recreation of medieval flours. I have used this for a wide range of baking projects and it performs well, although it is lower in gluten than modern flours (so less well suited to our preferred sorts of bread). As an interesting modern aside, if you do not have celiac but have trouble eating wheat, there is some evidence that rivet wheat may be better tolerated by people with digestive issues (see for example Sofi et al).

Elizabethan Blend Manchet Flour: Milled from a blend of heritage bread and rivet wheat varieties; the grains are “polished, stoneground and sieved to produce a creamy white flour with a unique texture and flavour that is ideal for all baked goods, including pastries and artisan-style bread.” (From the Bakery Bits website.) Although billed as Elizabethan, I actually think this is the best choice in flour if you want to recreate high-status medieval English baked goods. It contains a mix of bread and rivet wheat flours, and it has been stone ground and sieved (bolted) to remove the bran and yield a “white” flour. This is exactly the type of flour that my research supports for both bread and pie crusts. If you want to make a fritter recipe out of *Forme of Cury*, bake a pie fit to set before a queen, or even flour a joint of beef while it roasts on a spit, this manchet blend is perfect.

The Next Best Thing?

I will be blunt: Lammas Fayre’s flours are *very* expensive if you live in the US. Shipping is shocking and there is no way to lower the cost; there simply is not enough demand, and even if there were, the supply is very small. These flours are, by leaps and bounds, the most historically accurate option available for medieval cooking. However, these are not the only heirloom wheats still grown.

Anson Mills flour (see works cited for link) is based in South Carolina and is in many ways the American equivalent of Lammas Fayre. Their mission is to reestablishing heirloom landrace grains, but American (especially Southern American) varieties.. Their “Colonial Style Fine Cloth-Bolted Pastry Flour” works very well in historical pie and pastry recipes, and serves just fine for medieval pies. If Lammas Fayre is the gold standard, Anson Mills is the silver standard.

If you have a general interest in pre-industrial wheat varieties, you might look for someone in your area growing Red Fife wheat. Although this is a high protein bread-baking wheat, which is not in line with what we know of medieval wheat, it is a very old variety and is essentially North America’s “landrace” of wheat with some similar characteristics to earlier landrace wheats (varied growth habits within a single field, for example).

Finally, there are also a number of groups in Europe and elsewhere attempting to restore heirloom and ancient wheat varieties, many of which will happily sell you some seeds to try growing your own. See note after works cited.

Conclusion

As someone who is doggedly focused on pastry, discovering that there exists in this world flour grown from heirloom grain varieties and processed as it would have been 700 years ago was a revelation. I knew that a bag of white flour from the grocery store -- even a very nice bag of very nice flour! -- was not medieval, and that pained me. I remember how I felt the first time I cooked a medieval recipe over a fire. *This is it, I thought, this is what I was missing. This is what it was really*

like. As my fluency in fire cooking grew, I came to finally understand some of the idiosyncrasies of medieval recipes -- many of the steps that seemed extraneous to me are about reducing fuel use, and they do not tell us precise times because that is a meaningless concept in light of the complexity and variability of fire. Using historical tools and processes helped me dramatically grow my understanding of medieval food.

Using more historically correct flour, especially in pie baking, has been a similarly eye-opening experience. There are some ingredients that only make a passing difference in the final product, and where it is not worth seeking out perfectly historical options. In my opinion, flour is not one of them. Grains were the central pillar of the medieval diet, and selective breeding in just the last century has changed wheat so dramatically that what we have today would be unrecognizable to our forebears. It is my hope that there will be more options for obtaining (or growing) medieval wheat varieties in the years ahead.

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Places to Get Heirloom Seeds (Maybe)

I have not purchased from any of these sources and cannot speak to their reliability.

- <http://www.growseed.org/seed.html>
- <http://www.ancientcerealgrains.org/seedandliteraturecatalog1.html>
- http://prseeds.ca/seed_categories/grains-cereals/wheat/species/