

Mind the Gap

Cereals, Milling, & Why We Might Care



Grain! Grain! Grain!



First cereal grains were domesticated by early primitive humans. By 6k BCE we have physical evidence of ancient farming the fertile crescent region.

Grain! Grain! Grain!



Neolithic Found Crops (fertile crescent)

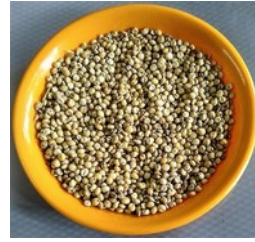
Emmer wheat

Einkorn wheat

Barley

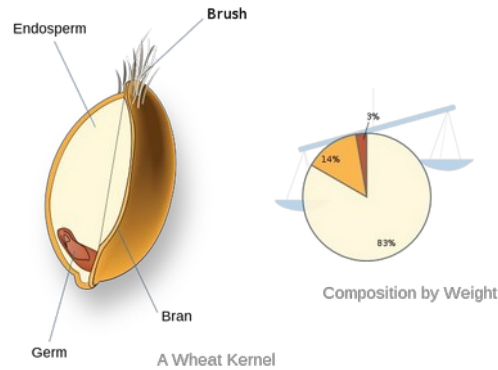
(lentils, peas, chickpea, bitter vetch, flax)

Grain! Grain! Grain!



Around the same time Millets & rice in East Asia & Sorghum and millets in sub-Saharan West Africa are being domesticated. In addition to eating, used as feed for livestock. Very important in the development of human civilization. Our word "cereal" is derived from Ceres, the Roman goddess of harvest and agriculture

What's in a kernel?



	Carb./g	Protein/g	Fat/g	Fiber/g	Iron (% daily req.)	Others
■ Bran	63	16	3	43	59	vitamin Bs
■ Endosperm	79	7	0	4	7	
■ Germ	52	23	10	14	35	vitamin Bs omega-3/6 lipids

Nutritional Value (per 100g)

The endosperm, germ, and bran.

Bran - hard layer on the outside! Rich in fiber & fatty acids.

Endosperm - High in starch! This is where most of the carbs come from!

Germ - this is the embryo! Essential nutrients, fatty acids, & fiber.

There's one extra part!

Husk/Hull/Chaff - protective sheath. Inedible. This is not the bran!

Some husks are easier to remove than others.

What do we brew with?



Wheat, Rye - huskless

Barley, Oats (not naked) - husked

Flaked & Rolled Cereals (Corn, Rice, Wheat, etc)

The compounds that provide the structure (cellulose, lignin, etc), can contribute to astringent, burnt, acrid flavors in the malting process. If you're not looking for those characteristics, you can find dehusked malted varieties.

Malting - For another day!



Milling!



The process of cracking open our grain to expose and crush the grain. This exposes the endosperm, which leads to higher efficiencies (more starch).

Husk is also part of the equation. For those using a sparge, it provides structure to the grain bed, allowing the mash and sparge water to access the starches, convert them into fermentable sugars and drain.

Stuck sparge (lame).

Grind to coarse - low efficiency

Grind to fine - stuck sparges

There are also opinions that grinding too fine can lead to astringency or other taste artifacts.

How do you dial in your gap?



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Trial and error - Brew! Brew! Brew! Record your efficiencies and whether or not you had any issues with your sparge, iterate until you're happy.

Calibrate and test - Feeler gauges - show off one.

- 1.25 coarse
- 1 standard
- .75 fine
- .5 extra fine

Sieve test

Stack sieves of different widths - shake and record the percentage that ends up at each section

Abridges test - Get a number 14 sieve and aim for 68% fall through

Do a test at 1 mm gap and a .5 gap

Demo & Discussion!