vinetur

What malt is in beer and why simply roasting a grain does not make it malt

Following barley from germination to base, crystal and roasted malts helps explain where colour and aroma come from, and what each type contributes during brewing.

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Controlled germination distinguishes malt from grain that has simply been roasted; drying and other heat treatments help shape its character. Educational illustration generated with AI.

Malt is one of those beer words people use all the time without always saying what it means. It becomes much easier to grasp if you follow a barley grain through the process: how it is moistened, how it begins to germinate and how heat can then take it in different directions, from a pale base malt to a deeply roasted specialty malt.

What malt is, and why it is not a different cereal

Malt is not a separate kind of cereal from barley. It is barley, or another grain, that has gone through a controlled transformation: it is allowed to begin germinating, and that growth is then stopped through drying and heat. So barley names the cereal, while malt names the transformed product. Roasting a grain without that earlier germination step does not turn it into malt.

Although barley is the grain most closely associated with beer, it is not the only one that can be malted. Wheat, rye and oats can be malted too. Even so, barley remains the clearest example for explaining the basic process, because it shows very plainly what changes inside the grain and why that preparation matters later in brewing.

Key idea

Barley is the cereal; malt is that grain after controlled germination and drying.

A grain that has only been roasted, without first being malted, does not become malt.

From dry grain to green malt

The process starts with selecting and cleaning the grain. Barley needs to be capable of germinating, so the aim is to work with grain that is sound, clean and as even in size as possible. Before colour or aroma comes into the picture, the first goal is much simpler: to begin with a raw material that can respond well to the process.

Then comes steeping. The grain is not simply left underwater until it sprouts. Instead, periods in water alternate with periods of aeration. As the grain takes up moisture, its growth is activated. That rise in water content is the signal for what had been dormant inside the grain to start waking up.

During controlled germination, the barley begins to grow, but under close control of moisture, temperature and airflow. At this stage, enzymes are activated or developed. You can think of them as biological tools that speed up transformations. The internal structure of the grain changes too: cell walls and part of the material surrounding the starch are modified, so that starch will be easier to reach later on.

At this point the grain is germinated but has not yet gone through final drying. That stage is known as green malt. Green here does not mean a special variety, nor does it necessarily describe a visible colour. It simply names a step in the process. One common misunderstanding is worth avoiding: at this stage, the starch has not been fully turned into sugar. Malting prepares the grain; it does not complete all the work that comes later.

Heat sends the grain down different paths: kilning, crystal and roasting

Once the barley has germinated enough, that growth has to be stopped. This is where kilning comes in. Its main job is to reduce moisture and halt germination, but it also begins to build colour and aroma. In base malts, kilning is managed in a way that preserves enzymatic activity, because those enzymes will still be useful later in the brewery. After this stage, the small rootlets formed during germination are usually removed.

Kilning should not be confused with intense roasting. Not every malt ends up as a dark or heavily roasted product. From green malt, several routes are possible. One is the path of kilned and finished malts, which may stay pale or develop fuller bread, cereal or nutty notes without entering the family of black malts.

Another route is the one typically associated with many crystal or caramel malts. Here, the green malt goes into a stage while it is still moist, allowing starch to be transformed into sugars inside the grain itself before the final heat development. Moisture is then driven off and the heat is increased to set the colour and aromatic profile. That is why a crystal malt is not simply a pale malt roasted a little longer.

The third simplified route is the one for intensely roasted malts. This usually starts with a malt that has already been kilned and is then given a stronger heat treatment in a roaster. That is where examples such as chocolate and black malts come from, bringing very deep colour and notes that can recall coffee, cocoa or very dark toast. These are sensory comparisons; they do not mean those ingredients were necessarily added.

Three routes from green malt

1. **Kilning and finishing**

   Stops germination and lowers moisture.

   Can produce pale base malts or more bready profiles without reaching intense roast.

2. **Typical crystal route**

   The grain remains moist while part of its starch is turned into sugars inside the grain itself.

   More heat then fixes the colour and aromatic profile.

3. **Intense roasting**

   Usually starts with a malt that has already been kilned.

   This is where examples such as chocolate and black come from, with lots of colour and roasted character.

A practical map of the main families

One useful way to get your bearings is to think in families by function, not as a compulsory ladder from pale to black. Pale base malts such as Pilsner or Pale Ale usually provide much of a recipe’s fermentable material and enzymatic power. They may show hints of cereal, soft bread or light nuts, but their main role is to act as the foundation for everything else.

A different group includes kilned malts with more developed malt character, such as Vienna and Munich. These tend to move into richer bread, crust, honey or nutty territory, without automatically becoming caramel malts. It is also worth resisting the

idea that they all have the same enzymatic strength: that depends on the specific product and on how far the heat treatment has gone.

There are also specialty malts that push biscuit, bakery or dry toasted notes, as with examples in the Biscuit style. They help show that not everything with a medium colour belongs to the crystal family or brings sweetness. Between a pale malt and a very dark one lies a broad range of profiles that can be dry, toasted, bready or nutty.

The caramel and crystal families deserve a note of their own. In commercial use, the two names sometimes overlap, but they do not guarantee exactly the same process or result from one producer to another. In the typical crystal route, and in caramel malts made the same way, part of the starch is turned into sugars inside the grain before the final heat development. Their profiles often range through caramel, toffee, dark fruit or a rounder sweetness, though there is no universal line that works across every catalogue.

At the darkest end are intensely roasted malts such as chocolate and black. They contribute a great deal of colour and a more pronounced roasted character. One quick comparison helps keep terms clear: brewers also use roasted barley that has not been malted. It can seem similar in sensory effect because of its colour and roast profile, but it is not malt, because it did not go through the controlled germination that defines malting.

Seen this way, the map becomes more useful: Family and examples Role Typical aroma cues Pale bases: Pilsner and Pale Ale Provide the base and enzymatic power Cereal, soft bread, light nuts More aromatic kilned malts: Vienna and Munich Deepen malt character Bread, honey, nuts Biscuit-style specialties: Biscuit Expand bakery-like aromas Biscuit, bakery notes, nuts Caramel and crystal Bring caramel-like profiles Caramel Intensely roasted: chocolate and black Add lots of colour and roast character Coffee, cocoa, roast These are broad guide groups and they can overlap. They help explain functions and profiles, not promise that any beer will taste a certain way just because one of these malts is named.

Family and examples	What it usually brings	Typical profiles

Pale bases: Pilsner, Pale Ale	Fermentable base and enzymatic power	Cereal, soft bread, light nuts
More aromatic kilned malts: Vienna, Munich	More malt character	Bread, honey, nuts
Biscuit-style specialties	Bakery notes and dry toast accents	Biscuit, bakery notes, nuts
Caramel and crystal	More caramelised profiles	Caramel, toffee, dark fruit
Intensely roasted: chocolate, black	Lots of colour and roast	Coffee, cocoa, very dark toast

Where notes of bread, caramel or coffee come from

Much of that difference appears when heat acts on the grain. Two terms help follow the idea without turning it into a chemistry lesson. Maillard reactions happen between certain sugars and compounds with amino groups, and they sit behind many bakery, toasted or nutty tones. Caramelisation, by contrast, refers to heat-driven changes in sugars. They are not the same phenomenon, even though both can shape the final profile of a malt.

That is why a malt can suggest freshly baked bread, caramel, cocoa or coffee without each aroma coming from a single reaction or a single production formula. Those associations are only guides. They help describe tendencies, but they do not let you predict exactly how every malt in a family will taste, or how it will come across once built into a finished beer.

What happens next: from starch to wort

To complete the picture, it helps to separate two stages that are often mixed up. Malting happens first and prepares the grain so that its interior becomes more accessible. Later, in the brewery, the malt is milled and mixed with water during mashing. That is where the enzymes help turn starch into sugars that move into the

liquid.

That sugar-rich liquid before fermentation is called wort. Keeping this distinction clear avoids a common mistake: malting prepares the grain, but it does not turn all of its starch into sugars; later, during mashing, the enzymes convert the available starch into sugars. Seen that way, different malts do not form a quality ranking from pale to dark. They are different tools: some provide the base and the power to transform starch, while others bring colour, aromatic texture or a more pronounced roasted character.

Four terms that help you follow the process

Green malt

Grain that has already germinated but has not yet gone through final drying.

It names a stage in the process, not a variety.

Enzymes

Biological tools that speed up transformations.

Later on, they help unlock starch and turn it into sugars.

Mashing

The brewery stage that comes after malting.

Milled malt is mixed with water to obtain the sugars that make up wort.

Wort

The sugar-rich liquid obtained before fermentation.

It is not beer yet.