Explaining the Falling Number Test

What does falling number measure?

The falling number test gives an indication of the activity of enzymes called alpha amylase and protease in wheat.

The test doesn't directly measure the level of enzyme activity, instead it measures the changes in the physical properties of the starch portion of the wheat kernel caused by alpha amylase and protease.

What do these enzymes do?

The presence of alpha amylase and protease are an indication that changes, linked to germination or sprouting, are beginning to occur in the grain.

Alpha amylase breaks down large starch molecules into smaller sugars, making them readily available to the germinating seedling as an energy source. Protease breaks down proteins in the grain.

Therefore, grains that have begun to germinate contain starch and proteins that are 'damaged', making them unsuitable for the production of products like bread and pasta.

Why does the falling number test take so long?

The test measures the number of seconds it takes for a plunger to fall through a paste of ground wheat and water.

To meet GTA standards, wheat has to have a minimum falling number value of 350 seconds, or about six minutes for APH2, and 300 seconds, about five minutes, for H1, H2, APW, and ASW grades.

As the test has to run for up to six minutes, and time is required to prepare the sample to be tested, it can take up to 10 minutes to run a falling number test.

Why is falling number important?

As falling number indicates the presence of 'damaged' starches and proteins in wheat, the falling number value is directly related to the dough quality, or its 'strength'.

Having flour that will produce dough with the correct 'strength' is essential for millers. Wheat with a low falling number makes 'weak' dough, and as such is unsuitable for many baking applications.

Thus, there is a direct link between falling number and the final quality of bread, in particular loaf volume, crumb quality and shelf life. Bread baked from wheat with a low falling number may have a very dark crust, be 'sticky' inside, and may be full of air pockets, or even hollow.

Pasta manufactured from wheat with a low falling number can have reduced shelf life, it may lose starch to cooking water, and become unacceptably soft or fragile when cooked.

If I store grain on farm, will the falling number increase?

The falling number value of grain stored for long periods *may* improve, but there are many variables to consider, particularly the quality of the wheat when it is stored, and the conditions under which the grain is stored.

Wheat with a low falling number is highly unlikely to improve enough in storage to satisfy milling grade requirements (300 seconds or higher).

Can I blend to improve my falling number average?

No. By blending low and high falling number wheat, you run the risk of **lowering** the overall falling number value of all of the wheat blended.

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