

# Particle Size



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## What can I do to reduce my feed bill?

This is the inevitable question of 2021. Unfortunately, due to the drought in western Canada and supply chain issues, including shipping challenges, the cost of ingredients locally is likely to remain high for a while. One option, however, is to maximize feed utilization through processing. Grinding (particle size reduction) is an integral part of feed processing. It serves several functions, but one of the most important is it increases the digestibility of nutrients. If the

pigs do not effectively digest the feed, you produce some very expensive manure, especially when ingredient prices are so high. Grinding damages seed coats, hulls, and other structures increasing the digestibility of the nutrients within the grain.

## How fine should you grind your grain?

The smaller the particles, the more significant the improvement in digestion and therefore feed conversion. However, there are practical limits. If you grind too fine, it takes a great deal more energy to grind, and it reduces how quickly you can process the grains. The other risks are if the feed is too fine, it can cause bridging and may not flow properly through your feeders, risking feed outages in your barn. Very fine particles can promote gastric ulcers, reducing performance or even resulting in mortalities in extreme cases. Most people agree that the ideal particle size should be, on average, between 650 to 750  $\mu\text{m}$ . When you grind any grain, you will get some fine material and some course, but on average, you should target 700  $\mu\text{m}$ .

## How can I measure the particle size of my feed?

You have a few options to analyze the size of your feed. At the Canadian Feed Research Centre, we use a system with ten sieves and a rotary shaker. We place 100 g of spread in the top sieve, the finest grind, let the unit shake the material for 10 minutes, and then weigh each sieve and plug the weights into a spreadsheet that gives us a bunch of data on particle size. You have the

option of sending samples to us or another lab and getting them analyzed. It is a good idea to check particle size when you change grains or conduct routine grinder testing. Therefore I think it would be an excellent investment to buy a few sieves and a small scale so you can test it for yourself. You don't need a complete set of sieves and a fancy shaker like we have to get a good indication of particle size. Benz and Goodband from Kansas State University have described and validated a system that only uses three sieves, and you can shake them by hand with the aid of a few balls and some caruncles. You will need a small scale as well. They also provide a spreadsheet to enter the weights of material on each sieve, and it calculates particle size for you. You can access the information at <https://www.asi.k-state.edu/research-and-extension/swine/particle-size-information.html>

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## What can affect particle size?

The single most crucial factor affecting particle size is your grinder. If you're using a hammer mill, what condition is your screen? How are the hammers? Is it time to turn or replace them? Worn parts can increase your energy usage, reduce production rate and affect particle size. The best option is to maintain your system routinely. The ingredients themselves affect particle size. For example, soft wheat not only grinds easier but also produces finer particle size. Fibre resists grinding, so if you are grinding high fibre grains, this can impact particle size. Your best option is to test your particle size, check the condition of your hammer mill or grinder and adjust if you need to.

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