

Technical Update - Treating Home Grown/Purchased Cereals



Information correct as at 10.00am on 31.07.2020

- Barley is still very good value for money
- Plenty of spring sown grain will be available
- Store new season grain for 2-3 weeks before feeding to avoid rumen upsets
- A combination of treatments to supply fast and slowly available starch work well

Back in April we reviewed the various methods available for processing home grown or purchased cereals. At the time we flagged up the potential for cost savings by using barley this year. Since April we have had a drought and now a return to more normal conditions. What this has meant is that the huge acreage of spring barley that was sown is likely to yield well with the rain arriving just in time in June. As we approach harvest, we are still seeing an ex-farm price differential of £40/tonne between wheat and barley meaning the cost benefit is still there.

There are numerous ways of treating grain and the following methods can be applied to wheat/barley/oats and triticale. Moist grain maize can also be crimped. Up to 5-6kg of dry matter of cereals/cow/day can be fed if you use a balance of techniques to give rapid and slowly digestible starch sources.

As we move into the new season crop remember to let grain “mature” before feeding. 2-3 weeks in store should see it safe to feed and try to introduce new crop gradually as old crop material is phased out.

Rolling:

The simplest form of treatment, grains are rolled or ground to break open the husks so animals can get to nutrients. Rolling can be done with on farm equipment or using a contractor. Grain needs to be dry for long-term storage (16% moisture or less) to prevent spoilage. Once rolled the grain needs to be fed relatively quickly otherwise it will heat and deteriorate.

The speed with which nutrients are available to the animal depends on how finely the grains are milled. There can be issues with grinding cereals too finely which can result in acidosis.

Crimping:

Grain is combined before normal harvest dates when the grain is still slightly green and the moisture content is around 30% but can successfully be done at lower moisture levels as long as the correct additive is used. Grain needs treating immediately otherwise it will heat and needs to be crimped and treated with an additive (normally an acid). The treated product is clamped and sealed like silage. Yields are good as there is minimal waste in the field and straw is available for baling, but it does need to be wilted.

Intakes are good with the moist product, but it is acidic and rumen health needs to be carefully monitored if large quantities are being fed.

The product is attractive to vermin so stores should have solid sides which should be lined with polythene.

Caustic Treating:

Caustic soda treatment of cereals has several benefits. It avoids the need to either roll or mill cereals providing the cow with a safer, slower fermenting source of starch compared with conventional

processing, which in turn reduces the risk of rumen acidosis. It also adds sodium to the diet which stimulates appetite and saliva production and therefore helps butterfats and provides a way of converting damp grain into a stable feed for storage so avoiding drying costs.

The process involves adding Caustic Soda (sodium hydroxide) prills to cereal grains in a mixer wagon.

Caustic soda is a very dangerous chemical and requires careful handling with protective clothing (especially for eyes) as it is alkali and produces extreme heat when it mixes with water.

A simple but effective recipe for treating cereals is as follows:

1. Weigh the amount of the cereal into the mixer wagon.
2. Carefully pour the required amount of caustic soda prills across the full width of the loader bucket ensuring there are no lumps. Add 30 kg caustic to one tonne of wheat/triticale/oats or 50 kg caustic to a tonne of barley.
3. Tip the caustic soda into the mixer wagon and mix dry for 5 minutes.
4. Add water as shown in the table below:

Moisture content of grain %	Kg of water to add/tonne to achieve 30% moisture
16	200
18	170
20	145
22	115
24	85
26	60
28	30

The water triggers a vigorous chemical reaction which produces an enormous amount of heat, which combined with the chemical and physical mixing softens and treats the cereal. The water is best added via the loader bucket for a uniform and vigorous chemical reaction.

5. Mix for about 20-30 minutes or until the cereal coats have peeled off.
6. Discharge the hot grain onto clean concrete, leave to cook for 6 hours, then spread the heap until 1 foot deep and allow to cool whilst protecting from heavy rain. This is the part of the process which is often overlooked, but is crucial for effective treatment and storage. This is particularly important with barley as the greater amount of husk present can cause it to go more lumpy if it not properly cooled before stacking.
7. Once cool, move the grain to stop it setting, and stack ready for feeding. Store separately, preferably undercover, and leave for at least 4 days before feeding
8. Treated grain will keep for up to 3 months, but if stored for a long period may need rewetting prior to feeding to avoid grains going through cows undigested. It is possible to store treated grain for longer, but it needs to be mixed drier (23-25% moisture) and then stored in a clean/lined bunker preferably under cover so the top can be left open to prevent it "sweating". Farmers have stored processed product for many months on this basis, but before feeding it needs to have water added to bring the moisture content back to 30%.
9. Do not mix with dry feeds until just before feeding otherwise the grain will dry out and harden.

10. Clean the wagon thoroughly after the treatment process. Ensure that the mineral fed is correct to balance the high sodium content of the product.

Urea Treating:

Mature grain is treated by rolling and adding a urea-based product which preserves the grain with ammonia released from the urea. This process is best carried out by a contractor with a high capacity roller mill and the ability to accurately mix the urea. There are 2 main proprietary products on the market – Home and Dry and Maxammon which contain a mixture of urea and products to enhance the conversion of urea to ammonia. Feed grade urea can be used, but it is riskier as you need to ensure that all the urea will be converted to ammonia.

As with caustic treatment the end-product is alkali allowing greater amounts to be fed safely. Additional benefits are higher protein levels produced by adding urea and the product is also unattractive to vermin.

The ideal moisture content for the product is 18-20% as this provides some additional moisture for the process to work. Once rolled and treated the product can be stored in a shed, Ag-Bag or even in an outside bunker. A tight seal needs to be made to ensure that the ammonia gas circulates around the stack without escaping. The heap should not be compacted as this will impair ammonia movement and potentially lead to untreated patches in the stack. With indoor stacks once the preservation process is complete the top sheet can be taken off if the product is sweating.

For further discussion or to help with any questions that you may have, please contact Consultant Support on consultantsupport@kiteconsulting.com or 01902 851007 / 07542 403225