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Use of distillery and brewing industry co-products as beef feeds

Introduction

There are many co-products from the brewing and distilling industries that can be useful feeds for beef cattle. Whilst they have advantages, there are also limitations to their use and what will suit some systems will not suit others.

Main co-products from malting and brewing

- **Malt residual pellets** come from the malting process. They are made from dried sprouted barley roots (malt culms) and malt screenings.
- **Brewers' grains** come from the brewing process. They are similar to draff (below) and are a product of the same process. Sometimes starch sources other than barley are used, such as wheat and maize.

Main co-products from distilleries

- **Draff** comes from the first stage of malt whisky production, when the malted barley is steeped in hot water to extract the soluble sugars. The liquid fraction is drained and draff is what remains.
- **Pot ale syrup** is the high protein, condensed residue remaining in the first still in malt whisky production.
- **Wheat dried distillers grains (WDDG)** are a product of either bioethanol or other alcohol production. They are obtained from drying the solid residues of fermented grains and adding back the evaporated syrups.
- **Maize distillers grains** are derived from the same process as WDDG, except using maize as the starch source.
- **Moist distillery co-products** eg, Traffordgold® is a moist feed produced from starch processing for the production of a range of human foods.

Table 1: Average composition of the main distillery and brewing co-products

Feed	Dry Matter g/kg	ME MJ/kgDM	Crude protein g/kgDM	Oil g/kgDM	NDF g/kgDM
Malt residual pellets	900	11.2	240	25	500
Brewer's grains	280	11.4	245	77	618
Draff	230	11.1	200	87	620
Pot ale syrup	450	14.2	340	2	2
Wheat distillers grains	900	13.5	340	70	346
Maize distillers grains	900	14.0	310	108	343
Traffordgold	500	13.4	200	50	250

How to feed these co-products and limitations of their use

Feed	Feeding notes
Draff/ brewers grains	The oil content can limit its use and care must be taken not to overfeed, especially in finishing cattle diets. 2-3kg/100kg LW can be fed per day. Useful high NDF feed, but can deteriorate quickly if not stored correctly in a pit/sheeted. It also needs careful mineralisation, as it is low in minerals.
Pot ale syrup	DM varies, acid with pH 3.5, keeps well. Consistency can be an issue, good for straw-based rations. No more than 1kg/100kg LW should be fed.
Wheat distillers grains	Physical pellet quality can vary depending on the source, though often they have better physical quality than maize distillers grains. Can be fed up to 40% of DMI.
Maize distillers grains	Contains high unsaturated oil content. Physical pellet quality is not as good as wheat distillers grains and it varies depending on the source. Can be fed up to 25-40% of DMI.
Malt residual pellets	Average energy content and often used as a filler in compounds. They have a low bulk density and have a high fibre content. Up to 50% of DMI can be fed but need to be aware of their relatively low energy content.
Moist distillery co-products eg, Traffordgold©	Can feed up to 50% of DMI. Best stored in a clamp and sheeted.

Which co-products to choose?

This very much depends on your farm set up. Moist co-products, such as draff and brewers grains, will need a clean concreted area for storage. If they are to be kept for more than a week, then they will need to be ensiled and consolidated to remove air that will cause yeasts and moulds to develop. Liquids, eg, spey syrup, which can be good value for money, need to be stored in a tank and thought also needs to be given to feeding it out. Feeding it in a mixer wagon is easier than by hand. Consideration should also be given to how quickly the product will be used. Whilst moist co-products can be good value, there can be a lot of waste on units not set up to store and feed them appropriately.

Co-products vary in their moisture content, physical characteristics, keeping quality and palatability, so knowing what how these characteristics vary between products and their limitations in rations is essential.

Points to consider when using co-products

- Cost – just because they are cheap does not mean they are a bargain. Look at the cost of the co-product on a dry matter basis compared to other feeds
- Consider what other feeds are already on farm and how co-products could compliment these feeds
- Consistency of product and of consistency of supply
- Check quality assurance. Ensure the co-product is assured for use on farm to comply with your own farm assurance standards
- Check that the co-product is suited to the needs of the cattle and make sure that the overall ration is balanced correctly
- Most distillery and brewing co-products are low in minerals, vitamins and trace elements, except phosphorus, so rations require careful balancing
- For further advice seek the guidance of a professional beef cattle nutritionist