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Waste Not

Brewlab colleagues Dr Keith Thomas and Brian Yorston look at how to deal with spent grain and what regulations you must comply with if you intend to distribute it as animal feed...

After a solid day brewing and cleaning vessels one of the least attractive jobs is dealing with the spent grains. Sacks or truck loads of sticky wet residues which need removing before another brew starts and before contamination develops and the brewery smells rancid. And not just a case of sticky fingers but sticky everything if a spillage occurs.

Depending on size there are many options to deal with spent grain. A larger brewery may sell it to a merchant. The merchant will have the contacts with the farmers and buy and distribute the grain from you to sell on. This way you will generate some income and will be guaranteed to have the grain removed from the brewery. You may even have a way of selling direct to the local farmer who will come and pick up the grain. The difficulty with doing both is depending on the weather and time of year there is either a glut or a famine for spent grain. In a wet warm summer, the grass will grow well, and the farmer may prefer to allow the cattle to feed on the luscious grass rather than pay for brewer's grains. Conversely in a hard cold winter grain will be at a premium. This may vary the price you get for your grain. Selecting a farmer or merchant who is guaranteed to take away all your grain is paramount. Spent grain can be put into silage and stored ready for use at a convenient time. The smaller brewer certainly will not want to throw the grain away as waste as this will incur a cost. It is often much better to give the grain away to an animal source. In all the above you will still have to conform to the law - see later.

Spent grain contributes about 80% of the brewhouse waste and is a useful co-product. For every litre of beer between 100 to 200 grams of this spent grain is produced. It contains amongst others cellulose, sugars and proteins and. Which can be fed to animals such as cattle, horses, and goats with a digestion system to cope with this.

Hence the most common route for this spent grain is via animal feed. In one report the farmer suggests not to feed his animal spent grain in the morning. They much prefer the brewery waste grain so much so that it stops them feeding on the much more nutritious balanced grass.

What brewers do not realise is if you feed spent grain into the animal system you come under Food Hygiene Regulations 183/2005. Which deals with the obligation to provide a safe feed not harmful to human or animals. These regulations came in because of the BSE or Mad Cow crisis of the 1980's. Here infected waste animal nerve tissue was fed to animals. This through the food chain, infected some humans with prions



causing death through the human variant of the disease called CJD or Creutzfeldt-Jakob disease. The regulations are based on HACCP principle which we all must comply with. It means that you must do a hazard analysis on all the by-products feed to animals and instigate systems to control these hazards. These systems need to be documented and reviewed just as you would for your brewery HACCP system. This just does not apply to spent grains but yeast, hops or anything else you may feed to animals.

So, what does this mean in reality? It means that you must have in place a system for cleaning any equipment for storing waste by-products. Covering containers during storage and removing grain in a timely fashion before it is spoiled. It may also mean looking at some of the equipment you use within the brewery. For instance, if you use a wooden paddle to mix your mash in the mash tun is there a risk of a slither of wood finding its way to the waste grain and subsequently being ingested by the animal, potentially causing harm. After all, HACCP is designed to avoid microbiological, chemical, and physical harm. The slither of wood may not only cause the wrath of the farmer but a potential large vet's fee. Some of the larger brewers retain a sample of each batch in a jiffy bag and keep it in the freezer. If there is a complaint that an animal died by eating your grain you will have a retained sample which could prove your innocence.

The industry has set up a FEMAS (Feed Materials Assurance Scheme) through the BFBi. For a fee based on size, your feed system will be audited and accredited by an independent body to ensure you comply with the law. Although I don't think it is compulsory to join the scheme, some of your customers may insist that you do so.

Some people may think that feeding brewery waste to animals is not environmentally friendly. After all some of the waste gasses produced by farm animal contribute 14% to greenhouse gasses. An alternate way of coping with spent grain is by anaerobic digestion to produce biogas to generate electricity. Recently, at least two regional breweries, have signed contracts to supply grain to be treated this way.

This is a topic for a future consideration but looking at the amount of interest in using spent grain it may not be long before potential users show serious interest and, given market forces, even proffer payment.