

Producing oilcake safe for use in animal feed

By Johan Schieke, associate product manager, Kemin Industries

Oilseed oils are usually produced using one of two different processing methods: mechanical screw pressing, or a combination of chemical extrusion and physical expelling (screw pressing).

During processing the oilseeds are subjected to very high temperatures, which reduces the bacterial risk in the oilcake to virtually zero. Unfortunately, this can all be undone if the oilcake becomes recontaminated further down the production process. Oilseed by-products remain one of the raw materials with the highest risk for bacterial contamination, according to test results, with *Salmonella* contamination a particular risk.

High risk of contamination

The cooling process is one of the production steps that poses the highest risk for recontamination. Coolers are the fulcrum point where heat is dissipated, creating a location where both moisture and some residual heat from steam and evaporation accumulate (especially where coolers run continuously). This creates an ideal environment for bacterial growth as moisture, heat and nutrients are required for bacterial growth, all of which are supplied in these types of production areas.

As oilcake continuously moves through the cooler, it can be recontaminated by contact with any bacteria present on the surfaces of the cooler. Equipment surfaces further down the production process can also be a possible risk for bacterial recontamination.

Managing storage options

Storage of oilseed by-products is another critical focal point, as it is central to the production of safe ingredients used in animal feed and human food. The facilities at which

by-products are stored, should be clean (and regularly cleaned and maintained through a hygiene programme) and the environment should be kept dry and well ventilated. Equipment used to transport and move the by-products, must also be kept clean and dry through a regular cleaning programme.

If the by-products are stored in bags, they need to be bagged at a temperature higher than 5°C above the ambient temperature, to prevent condensation inside the bags. The bags should also preferably be porous, to allow for continued ventilation during storage. Any excess moisture can cause mould and bacterial growth over time.

This will reduce the quality of the products by reducing its nutritional value (as microbes, such as bacteria and moulds, consume nutrients in order to grow) and contaminating it with potentially harmful bacteria, which may cause possible detrimental health problems in the livestock and people consuming these products.

Possible preventative measures

In the cooler and production areas, the following actions can be considered:

- Thorough physical cleaning of the inside of the cooler/production areas and removal of old product. This should be done as often as possible, preferably daily and at least weekly. Physical cleaning of the surfaces is essential, to remove dust that can be a carrier of bacteria, such as *Salmonella*.
- The application of an antimicrobial product onto the production surfaces can be considered to reduce microbial levels and thus reduce the risk of recontamination in these high-risk areas. These surfaces should always first be physically cleaned as far as possible before the antimicrobial is applied, for it to be effective at disinfecting the target

surface. The use of an antimicrobial should be repeated daily, to prevent recontamination and control microbial growth rates. The antimicrobial should also ideally be able to reach and treat some of the areas that cannot be physically cleaned.

During storage and transportation, the following actions can be considered:

- The floor of the warehouse where the by-products will be stored should be kept clean and dry through a regular cleaning programme. The use of an antimicrobial product is advised to disinfect the floor and any contact surfaces, and ensure that bacterial loads are kept as low as possible, especially if the by-products will be in direct contact with the area/floor.
- If the by-products are stored in bags, the bags should be kept clean, dry and cool. The bags should also allow for ventilation, with correct spacing and stacking, to prevent the build-up of excess moisture/condensation and potential heat from microbial growth.
- Any machinery being used to transport or move the by-products need to be physically cleaned and disinfected with an antimicrobial as often as possible (at least weekly, preferably daily after each shift).
- The trucks or other vehicles delivering the products should also be kept clean and be disinfected between deliveries. Special attention should be given to the inside of the vehicles into which the product is loaded, to ensure that disinfection takes place before every new load is transported. 📍

For enquiries or references, send an email to Johan Schieke at johan.schieke@kemin.com.