ELIMINATION OF SALMONELLA IN DRY FEEDS

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Exotic types of salmonella grow rapidly in feedstuffs and compounds if these are moistened. In soybean meal, cotton seed and rape seed cakes wetted to 54-72 % moisture exotic serotypes multiplied from 1 to 1 mio. cfu/g in 48 hours at 20-30 °C.

Figure 1. Growth of salmonella in moistened feeds

Feed compounds, oil cakes and other feed ingredients which are heated during oil extraction or pelleting, liberate moisture vapour which condenses on cold surfaces of transporting and cooling equipment. The condensed moisture traps dust and forms moist deposits where a few salmonella bacteria from the cooling air and the surroundings will multiply. Growth in moist material is, therefore, the major cause of salmonella occurrence in feed - not contamination from the environment (1).

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Figure 2. Dew point temperature of the exhaust air in a pellet cooler (inlet air temp. 15°C).

Contamination cannot be eliminated by cleaning and disinfection as it is not possible to clean equipment efficiently and often enough to keep up with the bacterial growth. Instead growth must be avoided by heating the surfaces of processing equipment:
1) to temperatures above the dew point of the air preventing moistening of feed
2) to temperatures above 46 °C where Salmonella don’t grow.

Infected feed cannot be detected and excluded by sampling and analysis with an acceptable safety. The risk from potentially highly infected raw materials (= heat treated feedstuffs) is most efficiently reduced by a repeated heat treatment. Tests with steaming followed by single and double pelleting of naturally infected oil cakes showed that short steam treatment alone reduced the occurrence of salmonella to about 1/10 and pelleting to 1/100 of the content of raw materials (2). By combined steaming, expanding and pelleting salmonella was reduced to 1/100000 of the count in unheated material (3).

![Graph showing the effect of steaming and pelleting on Salmonella count](image)

Figure 3. Effect of steam heating and pelleting
REFERENCES

