

## PRACTICAL EXPERIENCE OF FEED DECONTAMINATION FROM BREEDER'S PERSPECTIVE

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### Background

At a strategy group meeting in April 1985, following a discussion on the increasing incidence of salmonellosis in humans in UK it was agreed that Ross Breeders Ltd should embark on a salmonella eradication programme. In short all future thinking and planning had to recognise and focus on the fact that as primary breeders we were primary suppliers to the human food chain with clear responsibilities for human health. The multi disciplinary task team set up to develop and implement action plans to achieve this objective very quickly became aware of the enormity of the challenge. The use of process maps covering the many areas from the production and placement of day old pedigree chicks to the delivery of day old grand parent or parent stock orders to customers world wide emphasised the magnitude and complexity of any eradication programme. **The target was to eradicate all salmonella.** One of the key contributors identified to ensure success was the absolute need for salmonella free feed and water.

### Requirements

What were we as a customer looking for?

- **Guaranteed Salmonella free feed** at all times.
- 2,500 tonnes of feed per month.
- 26 ration types per month with tonnages varying from 2 to 1,250 tonnes per type.
- 70 farms to receive individual deliveries on an agreed schedule.
- Dedicated vehicles and drivers i.e. vehicles that were used only for the delivery of decontaminated feed to Ross farms.

With these parameters in mind the challenge was to design the most efficient plant at least capital cost with the lowest possible operational and delivery costs. The team looked at two options:

1. Build and operate our own feed mill.
2. In conjunction with a national feed compounder incorporate a dedicated decontamination plant within an existing general mill. At that time most mills were multi-species suppliers.

The first option was rejected for several reasons:

- Primary breeding had to remain our core business.
- Stringent planning consent requirements in the preferred location.
- Capital cost.
- Non-competitive purchase of raw materials due to small volumes.
- Lack of skilled feed production management within the organisation.

The second option involved discussions with all national compounders in the UK with the aim of having our very specific feed requirements supplied by professionals on a

contractual basis. In general their initial reaction was almost one of disbelief at the request and a total lack of enthusiasm. Working with J. Bibby Agriculture the prototype decontamination unit was operational in Spring of 1986 with an agreement that we would learn from this prototype and our mistakes and have a revised and upgraded decontamination unit operational within 2 years. This plant in effect was operational in June 1988. It was basically a room with positive air pressure within the same existing general mill. The most important details are:

- The construction of the room was high specification creating a hygienic environment that was easy to clean.
- The heat treatment equipment was based on time, temperature and moisture parameters which independent experts and our own microbiologists agreed were effective in destroying salmonella.
- A secure ring main system was incorporated to ensure that no heat treated food is released to the clean side of the plant without having reached the agreed kill parameters.
- Fats had to be sterilised before addition to finished products.
- All incoming air to the "cooler" was filtered and ducted direct from the outside of the building away from any exhaust system.
- Decontaminated feed would be transported by airtight conveyors to dedicated holding bins.
- Deliveries would be by dedicated vehicles.
- Limited personnel (whose movements into and out of the restricted area were tightly controlled).
- All raw materials entering the general mill would be sampled and checked by Ross laboratories.
- Weekly random environmental sampling of the Ross room.
- Monitoring of time, temperature and moisture parameters.
- Rodent, wild bird and insect control programmes.
- Protocols and procedures for the movement of equipment into and out of the restricted area.

Within a similar timeframe and elsewhere in the UK poultry feed industry pressure was mounting for improvements. In the late 1980's several of the major retailers of broiler meat produced Codes of Practice for Poultry Feedstuffs and Feedmills. This was basically a commitment by the retailers and their suppliers to the commercial eradication of salmonella in poultry. "All feed must be commercially sterile and from audited feedmills. All feedstuff with the exception of whole grain, must be treated through approved heat treatment using a validated process." Traceability and auditing checks were carried out by consultants on behalf of the retailers. Some of these Codes have been recently revised - 1998/1999.

In the Autumn of 1989 the then UK Minister of Agriculture, Edwina Currie, made her statement "that all eggs were infected with S.E." A raft of legislation covering breeding

flocks, hatcheries and processed animal protein quickly followed. Significant advances in the production of breeder feeds were made in the early 90's. The feed industry issued Codes of Practice and standards for raw material suppliers. By the late 90's all broiler breeders in UK were receiving feed that had been through some form of thermal process.

In June 1999 a new ABN/Ross plant, using the same basic principles but with enhanced outloading facilities became operational. The only change was that J. Bibby logo had changed to A.B.N.. The various heat treatment combinations used offer two options:

- a. Total kill - leading to eventual eradication or
- b. knock down - reducing the numbers of feed borne pathogens in the feed.

Recent unpublished work carried out in the UK by Chipping Campden Food Research Association has shown that even a thermal process which gives a substantial knockdown in the number of salmonella present can significantly reduce isolation rates in flocks fed with such treated feed.

#### Monitoring of treatment efficiency

The success of feed treatment and all other preventive measures to minimize the introduction of Salmonella on the farms is investigated by intensive sampling according to the following scheme:

- a. **Raw materials:** Weekly
- b. **Mill environment:** Twice per month
- c. **G.P. flocks:** From week 3 to week 60 every 3 weeks 60 cloacal swabs, 6 drag swabs and 6 dust samples per house.
- d. **Day old chicks:** Every elite or GP flock in production is sampled weekly by M.A.F.F. officials at Ross Breeder hatcheries, 50 chicks or dead in shell per flock are tested in government labs. Ross Breeders sample every hatch, every chick.
- e. **Hatchery Hygiene:** Breeder hatcheries are monitored at a minimum of once every 4 weeks.

This level of monitoring has been dictated by our M.D.'s declaration in 1989 that **"Ross Breeders would never knowingly sell stock that were infected by any salmonella."**

#### Summary

The decision to embark on a feed decontamination programme in 1985 was seen as a brave and visionary one. I believe it was the correct one for an international primary broiler breeder.

- The decontamination of feed for salmonella is relatively simple. **The challenge is to prevent re-contamination.**
- The success of this particular customer supplier/partnership has been based on openness, honesty and continuity - three of the key players in the original task team are still involved today.
- Training, motivation and involvement of the dedicated mill operators and truck drivers is essential and must be on-going.

- Always assume that raw materials are positive and therefore the general mill environment must be.
- Management must constantly focus on attention to detail and ensure that all procedures and protocols are strictly adhered to at all times.

Clearly there is a significant capital cost involved in any decontamination process, but equally the value of G.P.S. stock is considerable and how can one realistically value pedigree breeding stock. I believe any cost risk analysis carried out by a primary breeder will support the cost of feed decontamination. I can say that since June 1988, we have been unable to link any outbreak of salmonella within our production system in Scotland with contaminated feed.

#### Breeders Perspective

Initially there were concerns about the likely impact on genetic progress due to the removal of salmonella positive pedigree flocks or the detrimental nutritional effects caused by the time temperature regime used. These were addressed by appropriate actions and actual production at all generation levels continues to improve. Production is, of course, multi-factorial involving genetics, bird health nutrition and husbandry practices.

The overall reduction in feed borne pathogens allowed the Company to remove growth promoters from all diets in June 1999 without any adverse effect on production. In the UK, with the ever increasing public focus on human health, the need for decontaminated feed has never been more necessary.