Salmonella – an old adversary comes back!

As we go to press it would appear that a major food poisoning outbreak is gathering momentum in Spain. The outbreak has so far (8th August) involved over 2,100 cases of human gastroenteritis (food poisoning). The source of the outbreak is a single brand of pre-cooked chicken and the serotype is Salmonella hadar. Over the years S. hadar has had a close association with poultry.

So, the threat of salmonella food poisoning is ever present!

Many salmonella infections in poultry start at the breeder farm and work down to the commercial generation, but it is still too early to say whether or not this was the case in this particular Spanish incident. Even so, this gives us an opportunity to recap on the key issues of salmonella in breeders and hatcheries and to address key points on food poisoning in man. Let us start with the latter.

Food poisoning requires an adequate dose of salmonella to get into the upper intestine of the human victim. As the stomach's acid is a very effective killer of bacteria this means that the person who is going to succumb to food poisoning needs to ingest at least thousands of the salmonella organisms so that some can get through to the intestines.

Usually this number of salmonella is not present on a food and so handling abuse, such as storage at high temperatures, normally occurs to cause a salmonella population explosion in the food product. Even then, salmonella is not a food poisoning issue if the poultry meat or eggs are properly cooked before consumption. However, post cooking contamination can occur.

The very young (whose stomach acid is not fully established), the very old, the immunosuppressed and those with a concurrent infection can be more susceptible to salmonella infection. Also, if something has neutralised the stomach's acid, a person becomes more susceptible to infection. This was seen in the USA a few years ago with executives who were grossly overdosing themselves with antacids!

That is enough about man – now let us look at the key aspects of salmonella in breeders.

Where does salmonella come from? Virtually anything coming into the breeder farm can carry salmonella into the flock, but the commonest routes are via the day olds, the feed and wild birds and vermin. Control at this level, therefore, focuses on three key areas.

Firstly, there are the day olds. These need to come from a salmonella clean source and from a hatchery that you can trust to deliver what it tells you it is going to deliver.

Secondly, there is control in the feed and there are a variety of acid based and similar products available for this purpose. For this to work each and every tonne of feed must be correctly treated – the tonne of feed that misses out on treatment will be the weak link!

Finally, there are the wild birds and vermin and here biosecurity to keep them out of the sheds is paramount. Even then a sensible baiting programme for rats and mice is strongly recommended.

Biosecurity is also very important in relation to everything else that enters the farm. Do not let equipment on to your farm without either disinfecting or fumigating it.

People can carry salmonella so it is best to exclude anyone who has recently had diarrhoea. Even then, showering is worthwhile and here special attention should be given to the hands.

Staff must never take their own food into the poultry houses. If food can cause salmonella food poisoning in man then it can certainly introduce salmonella into your breeders if they consume it!

A breeder flock can be on the ground for over a year – it just needs one instance of the rules being broken sometime during that year and the salmonella free status of your flock can be lost!

When we look at salmonella control in any poultry situation it has two key component – ensuring that the salmonella can not enter the farm and, then, if this should fail, ensuring the birds have enough immunity to ensure that the salmonella infection does not become established in the flock. This is achieved by vaccination.

Some people say, 'why worry about the former when the latter will protect us?' The answer is that vaccination does not always protect.

Firstly, the vaccine may be serogroup specific and the salmonella entering the farm may be of a different serogroup. Secondly, vaccination is always a balancing act between the level of immunity present and the level of salmonella challenge.

This being the case, if we can reduce the salmonella challenge by all the measures we have highlighted then the vaccine has an even better chance of doing a first class job.

Remember vaccination has two key roles in breeders – it protects the breeders, but it also protects the progeny by reducing the vertical transmission of salmonella down into the day old chicks and by providing these chicks with a protective shield of maternal immunity. This immunity then protects the chicks in their first few weeks on the ground when they are most susceptible to a salmonella challenge.

Here again the protection conferred by the vaccine is very much dependant on how well the vaccine and vaccination process are managed. For example, if we are using a dead vaccine those birds that are not injected will have no protection and if we are using a live vaccine and we accidentally kill it, it will not work.

This is easily done by overheating the vaccine or by concurrently administering it with a water sanitiser. Yes, you may well smile, but farmers do actually do this!

When it comes to hatcheries the role of biosecurity is paramount in keeping salmonella out.

Control of inputs is important, but the role of effective clean down and disinfection after every hatch can not be over emphasised.

It must be remembered that the hatchery is the link between the commercial broiler or table egg farms and the breeders and that these commercial farms are, at best, of an unknown salmonella status and, at worst, are salmonella positive.

This being the case we must ensure that anything that goes to these farms, such as vehicles and chick boxes, are thoroughly cleaned and disinfected so that they do not bring salmonella back into the hatchery that can then track back to a breeder flock.

Finally, when it comes to salmonella management we must not remain in the dark and pray! We need to monitor our breeder farms and hatcheries so we know what their true salmonella status is and what changes are occurring. This will tell us if our controls are working or if we need to do more. There was a danger that avian influenza and the lack of major human food poisoning outbreaks had taken our attention away from the subject of salmonella and that we were becoming complacent.

However, the recent happenings in Spain have re-emphasised the fact that salmonella is an ever present issue and one which we must always guard against. ■

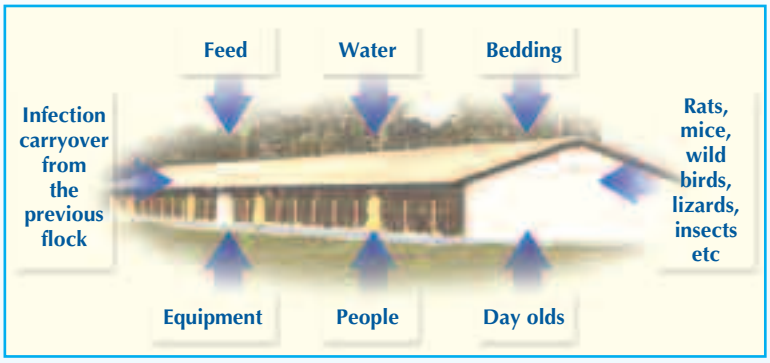

Fig. 1. The breeder farm – sources of salmonella.