Incubation and chick handling – where next?

If we stop to reflect on what has happened in the field of incubation over the last couple of decades we get a surprise on how far we have progressed. If we go back to the late 1970s, labour intensive fixed rack, multi-stage machines were common, but trolley based machines were coming in and single stage was a non-entity in commercial hatcheries.

When it came to chick handling staff were the usual means of performing most chick based processes, like sexing, grading, vaccination and the various surgical procedures, but the occasional conveyor or carousel was in operation.

Now we come to 2006 and things have changed! Our thinking on incubation has advanced a lot and controlled atmosphere incubation with an elevated carbon dioxide level for the first week or so is becoming popular. Hand in hand with this is the move towards single stage machines because, for the obvious reason of regularly opening the door, you can not continuously maintain carbon dioxide levels in a multi-stage setter.

When it comes to chick handling automation has come to the fore and all the processes previously referred to can now be done automatically. For some diseases we no longer need to vaccinate the chick because the egg receives the vaccine at transfer in a fully automated process. The technology is such that we do not waste vaccine because the machine detects which eggs do not contain viable chicks and ensures that they are not vaccinated.

A 1980s Russian hatchery.

Recently, the technology has become commercially available that will feather sex our chicks with virtually 100% accuracy.

Go back to the late 1970s and hatchery records were hard backed books with row after row of neat handwritten entries and the poor hatchery manager would sit down with a calculator to calculate key performance indicators like fertility, hatch of set and hatch of fertile. Nowadays, computers are the norm when it comes to hatchery records.

On the staffing side a couple of decades ago there were no key selection criteria, but nowadays staff need expertise in specific areas such as computer skills, electronics and engineering.

Things have certainly changed over the last couple of decades, but what is going to happen between now and, say, 2026?

To address this question we need to look a bit more closely at the hatchery's role and the key factors that impinge on it and those

Continued on page 14

Modern technologies enable us to monitor eggs throughout the incubation cycle.

Continued from page 13
who supply its eggs and take its resulting chicks.

The key thing that is going to stay to the fore is cost minimisation and to this end producers will want to see their chick prices reduce or, at worst, remain static.

However, will this be the ultimate goal or should we attach to it an overriding caveat of maintaining or improving quality'?

Yes, costs are critical, but over the next couple of decades will quality issues come more and more to the fore? Yes, salmonella freedom will remain a key prerequisite, but what about campylobacter?

Some American research indicates that vertical transmission may occur. If this is substantiated, then, 'as sure as eggs are eggs', certain supermarkets will latch on to this. They will place campylobacter freedom as another requirement on their supplying poultry integrators!

Then there is the possibility of new food borne pathogens and if one of these is linked to poultry and, more specifically, vertical transmission in poultry, the spotlight will quickly focus on to hatcheries and breeders.

If we look back over the last couple of decades then at their outset Salmonella enteritidis was not a poultry pathogen, campylobacter had little significance placed on it and other well known food borne pathogens such as E. coli O157, Listeria monocytogenes and food borne viruses were not of too much importance. How things changed by 2006! Thus, do not be surprised if similar changes occur by 2026! But, at this point in time nobody can say what the new 'bugs on the block' will be.

The future is going to see one word firmly placed in all our vocabularies and that word will be 'uniformity'.

The performance of broiler divisions will become more and more dependent on the production of uniform chicks and then maintaining that uniformity through to good seven day chick weights. But when we look at these chicks the word uniformity will become more important in other areas, for example, uniform maternal antibody titres.

Recent years have seen significant advances in the provision of uniform environmental conditions throughout incubators so that all eggs are offered much more similar incubation conditions than they once were. The benefits of this have been seen in terms of hatchability, chick quality and early broiler performance and these have been aided by the increasing use of single stage machines.

Looking to the future can the incubator manufacturers fine tune what they have already achieved so that early broiler performance is even better?

Then we come to the interesting debate on tomorrow's hatching eggs because, when all is said and done a key determinant of the quality of the day old is going to be the quality of the hatching eggs they are derived from. Will improvements here come from the breeders or the nutritionists?

Will nutritionists find ways to put more vitality into day olds and will this be via the breeder feed or by direct application into the egg? Will we know much more about mineral metabolism and its impact on key enzyme systems? Will organo-minerals be much more important than they are now?

We have just had three new planets added to our universe. Could we will still find new vitamins or key growth factors?

Tomorrow's broilers are going to be killed at even younger ages so the scope to use therapeutic antibiotics will be reduced and consumerism could well convert this to a zero usage.

This being the case, the use of vaccines will become relatively more important but then there will be the dilemma that the proportion of the broiler's life when effective immunity is available from vaccination will be reducing. Will the time come when cost benefit analysis then becomes an everyday tool to determine whether we should vaccinate?

Will vaccines be developed that produce effective immunity more quickly?

In the future will chick processing time be seen as non-productive time for the broiler chick and will more attention be given to minimising the time between hatching and

the chick consuming its first feed on the farm?

Chick handling will focus more and more on reducing labour so that the processing cost per chick is reduced. Hatcheries are going to be looking more and more into the logistics of chick processing and this will focus on minimising the distances chicks move and actual handling processes. How long will it be before chicks are moved automatically from the setter into the back of the chick lorry with neither the chick nor the chick box being touched by a human hand?

In the future will the chick take its first non-yolk meal in the hatchery or even in the hatcher? Will we be routinely administering probiotics or similar products to all chicks automatically by 2026?

We have seen automated feather sexing become available earlier this year. By 2026 what other measurements will we be undertaking on our chicks in the hatchery? Will they all be automatically boxed by weight or will they all be boxed by their Gumboro titre?

This may sound a bit way out but then in 20 years science will progress a lot, especially if progression is exponential rather than linear as we are led to believe is now the case with scientific discoveries.

One of the real developments over the next 20 years will be with the labour we use in our hatcheries. As countries develop the availability of cheap labour will disappear and the hourly labour cost will increase significantly.

The end result should always be quality chicks.

This will obviously encourage further automation, but will it also impact on the skills base in our workforce and result in fewer, but higher calibre, staff being employed?

So, this then begs the interesting question of what will be the requirements in tomorrow's hatchery workers? Incubation has progressed a long way since the time when the ancient Egyptians incubated eggs by placing them on a pile of composting camel dung. One thing is for sure, the next 20 years will be interesting, challenging, demanding and, hopefully, rewarding. ■