Synergistic partnership creates Brazilian success

International trade in poultry meat products is increasing and over the last half decade has increased by almost a third. If we look at Brazil the change over recent years has been more dramatic with exports, as a percentage of world market share, increasing from 17.2 to 36.7% over just six years.

Currently, exports amount to some two million tons with major export markets being the Middle East, Asia, Europe and Russia although the last two combined are equivalent to, or less than, either of the first two.

Recently International Hatchery Practice visited Brazil to see what was happening and, in particular, to visit that country's major supplier of breeding stock.

One of Agroceres Avicultura's grandparent farms.

Meeting market needs

The changing profile of product (see Table 1) highlights the need for a good yielding, high performance final generation bird as in just five years the proportion of product as whole birds has dropped from almost 60% to one third of the total.

When it comes to breeding parent stock annual placements have risen from 15.7 million in 1990 to over 32 million in 2004 and over a similar period the placement of broiler day olds has risen from 1.6 to 4.2 billion per year.

To the experienced eye these figures may not quite match up and this is because of several relevant factors.

Firstly, in Brazil flock age at depletion varies according to market needs – if the market is weak breeder flocks will be taken out early but, if it is strong, flocks have been known to be extended.

Product	Domestic (%)			
	1998	2000	2002	2003
Whole birds	58	52	40	33
Cut ups	36	40	50	55
Further processed	5	8	10	12

Table 1. The changing Brazilian domestic market.

In addition, it should be appreciated that there is a time lag between placing a breeder flock and placing its progeny and so a significant part of a flock's progeny may be recorded in the following year rather than in the same one.

If one looks at breeds in Brazil the broiler market is currently dominated by the Ross and Cobb breeds who have some 85-90% of the market. At this level there is not much between these two breeds with the exception that the Ross is probably a bit better when it comes to breast yield.

However, when it comes to the breeder the difference is much more pronounced with Ross grandparents producing more parent stock chicks per breeder hen and parent flocks typically producing extra chicks.

Each pedigree farm at Agroceres Ross is surrounded by a security fence and is devoid of vegetation. Note the concrete pads by the extractor fans.

Established and respected source

The strength of the Ross bird in Brazil, where it has more than 40% of the market, also has much to do with the fact that it, and its source of supply, is extremely well established and respected.

In Brazil Agroceres Ross is a company whose equity is held by local company

Continued on page 8

Continued from page 7
Agroceres and the international breeding company Aviagen.

This company operates one of Ross' four international pure line breeding operations and provides grandparent day olds for major Brazilian customers and for its sister company, Agroceres Avicultura, who take the breeding operation one level lower down the breeding pyramid and market day old parent stock chicks across Brazil.

In addition, Agroceres is an important member of the Ross family in South America and if other Ross franchise breeders have shortfalls in stock they will do all they can to help out fellow fran-

Above and right, two of the new pedigree farms.

chisees in neighbouring South America.

In many ways Agroceres Ross is an independent operation that is providing product that is best suited to the requirements of the Brazilian market and, as such, their stock is ideally suited to coping with the Brazilian environment, nutrition and health status.

This has to be coupled to the overall breeding strategy of Aviagen and so there is very close co-operation with the Aviagen technical team in Scotland and, in particular, with their geneticists.

Team approach to selection

A good example of this team approach is when it comes to breeding stock selection. The team at Agroceres monitors the birds, having first identified them by their unique bar codes, and records the data into hand held terminals, which are downloaded into a laptop at the end of the session.

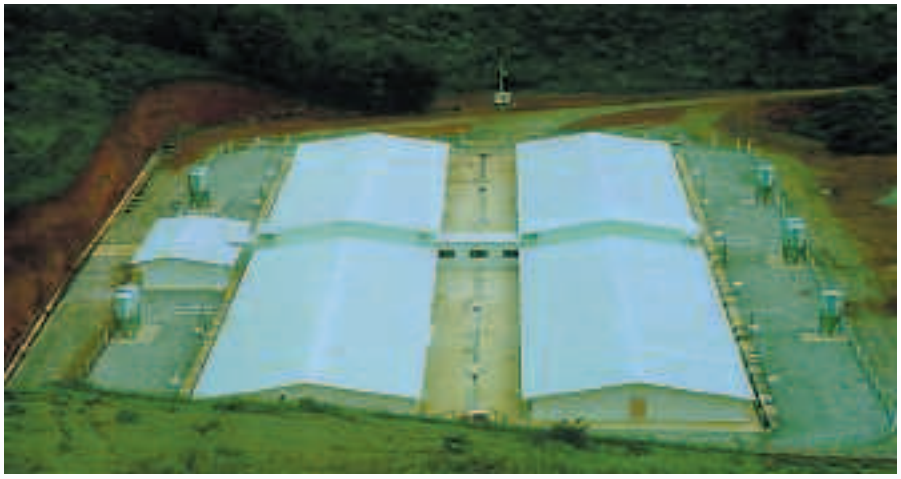
Data from this laptop is then sent from the elite farm in Brazil via the farm's own satellite dish to Aviagen's headquarters in Scotland where it is analysed.

When the selection team returns to the farm in Brazil the following day the breeding values have been transmitted back to Brazil where the Agroceres Ross geneticist makes the final selection decision.

So, what are the geneticists looking for? In a nutshell they are looking for a balanced high performing bird that will perform at breeder and broiler levels. This being the case the breeding programme places emphasis on parent traits such as egg numbers, fertility and hatchability and broiler traits such as conformation, FCR, live weight and robustness.

These are then coupled up to meat/carcase quality traits such as meat quality and disease resistance traits, be they specific or more general ones.

The data for the broiler traits tends to



be recorded in the first 6-7 weeks of an elite flock's life, while that pertaining to the breeder traits is recorded thereafter.

In this context it must be remembered that there is a real time lag in the breeding programme in that recording and selection done in the elite flocks today will only impact on the final generation product in 2008.

Why does the breeding programme work? The answer lies in the team spirit that exists between Agroceres and Aviagen and the technology that is used such as REML and BLUP and putting the right relevant emphasis on each of the genetic parameters and breeding values.

In addition, and in order to maintain a consistency around the world, Aviagen hold regular meetings that are attended by the selecting teams from Scotland, the USA, Brazil and South Africa and are high powered frank discussions that look for ways to do an even better job.

For its part, Aviagen in Scotland has extremely sophisticated computer hardware and software that is state of the art and second to none when it comes to genetics and selection.

The team in Scotland has a wealth of experience in data interpretation, in defining and fine tuning genetic parameters and in determining breeding values.

The Brazilian programme

What specifically is happening in the Brazilian programme? Firstly, quite a bit of effort is being placed in the selection of breeder traits. For example, the number of settable eggs is defined as the number of settable eggs laid by the bird and not as collected from the nest. That is, the bird is not penalised for eggs which become dirty or are broken in the nest.

Egg numbers are very much dependent upon the hen being able to lay extended clutches with minimal downtime between clutches and so a hen in the selection programme who goes for four days or more without laying an egg is viewed very negatively. Trap nesting is used in Brazil, but breeding is done by bird group and typically there are 10-12 hens to one cockerel in each group.

At the broiler level robustness is defined and selected for on the basis of the bird being able to perform well in the Brazilian environment.

When it comes to FCR all males and a proportion of females are evaluated in individual cages. However, work is being done to evaluate FCR in groups using feeding stations which identify each bird by transponder and recording what is eaten every time the bird goes to

Continued on page 11

One of the pedigree farms. Note, right, the control of input air and the bare earth around the farm.

Continued from page 9
the feeder. Thus, FCR is being determined in a more real scenario and consideration is being given to issues such as competition at the feeder. This is very similar to the technology that has been used in the pig sector.

When it comes to yield and conformation there is still nothing to better the eyes of an experienced selector but scientific data is being used to reinforce the selection choice. Here a key aspect is the processing and detailed cut up analysis of siblings.

Scientific measurement

Needless to say, the Brazilian selection programme gives some emphasis to the Brazilians' preference for dark meat and, in particular, thighs and drumsticks. At pedigree (elite) level a lot of data is amassed on the growth characteristics of birds between seven and 42 days.

Robustness appears to be a vague entity to many, but at Agroceres Ross efforts are undertaken to put some science into its measurement. For example, aspects such as feathering over the back and thighs and cardio-respiratory capacity are measured. When we were in Brazil we were given a detailed insight into the Agroceres operation but for sound biosecurity reasons we did not enter any flocks.

Currently, Agroceres Ross operate three pedigree farms that feed eggs into a dedicated pedigree hatchery. Grandparent chicks destined for Agroceres Avicultura then go on to one of six grandparent farms and these are served by three hatcheries.

As part of the inherent biosecurity in the system, farm:hatchery links are enforced and so the eggs from one farm always go to the same hatchery.

All the farms are of a similar design and are located on a complex. Entry to a complex is strictly controlled and only essential staff and visitors are allowed access and then only after having tested negative on a stool test for salmonella.

All persons entering a farm complex must shower and put on company clothing. This is repeated at farm level.

Interestingly, each site has dedicated clean (inwards) and dirty (outwards) roads. In the immediate vicinity of each house a 'bare earth policy' is followed and there is no vegetation.

This is because it is strongly felt that even the shortest grass will provide cover for vermin or insects and, therefore, increase the likelihood of them coming to a house. Immediately around each house is concrete and the area of concrete is enlarged under each fan outlet. All houses have positive air pressure.

Each farm has its own perimeter fence and feed bins are located at this. The feed is brought to these bins by a dedicated feed truck, but even this is not allowed into the immediate vicinity of the breeder houses.

Easy to clean houses

Internally all houses have been designed to facilitate cleaning and so stainless steel is very much to the fore and no wood is used (see the pictures at the top of page 13). Special effort was put into ensuring the quality of the floor which has a very smooth finish. Once again this is to facilitate cleaning.

The hatcheries use the locally produced Rooster incubators.

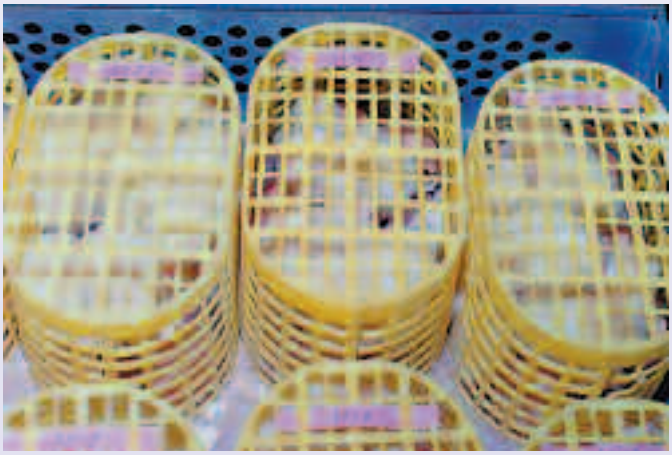
Eggs are collected at least six times a day and, depending on the farm, are either fumigated or dipped in a sanitiser. Eggs are then taken to the hatchery daily.

A primary egg grading occurs on farm and this focuses on size and broken and

Continued on page 13

One of the parent stock hatcheries.

In the pedigree hatchery sibling chicks are hatched in baskets.



The inside of the house is designed to facilitate cleaning and, right, plastic netting is used for the same reason.

Continued from page 11

dirty eggs. A secondary grading of eggs occurs at the hatchery level and this is basically a visual assessment, although all eggs are weighed and only eggs of 54g or more are set.

The final commercial product is the AgRoss 308 female line. Typically grandparent flocks go through to 65 weeks and the average output of the flocks in Brazil is 57.3 female chicks per hen housed and the top 10% of flocks are achieving 61 or more female chicks per hen housed.

Performance figures

Parent flocks typically lay through to 66 weeks of age and recent results from some 12 million birds puts average egg production at 180.8 and the top quartile at 187.8 eggs. Corresponding figures for chicks were 144.8 and 150.2.

Having done all this to produce breeding stock which are, in effect, going to be the backbone of Brazilian poultry production, it is very important to be able to confirm that the product is as healthy as it is claimed to be.

To do this Agroceres operate a comprehensive monitoring programme that was designed in co-operation with Aviagen.

Much of the monitoring is focused on salmonella, mycoplasma and leucosis and is never solely reliant on one type of test.

For example, the salmonella testing focuses on cultural testing of samples from the farms, birds, hatcheries, feed mill and even the staff. A blood testing programme of the flocks is also carried out.

As far as feed is concerned, no feed is consumed by the birds in the breeding pyramid until its test results for salmonella are known to be negative.

In addition, because salmonella can be present at such low levels, testing feed for enterobacteria is also done to prove that the treatment processes have been successful. Emphasis is also placed on the testing of egg and chick trucks.

Recipe for success

What has been the recipe for success? Success has come from a partnership in which both partners have brought benefits to the table.

Aviagen have brought the genetics, technology and technical support and Agroceres have brought local knowledge and a solid trading base in what can only be described as an interesting and challenging market place.

Somehow these have blended synergistically to produce one of poultry breeding's real success stories. ■

All the flocks at Agroceres are regularly screened in the company's own laboratory. Left, bloods are being tested by the rapid slide agglutination test and, below, samples are being screened for salmonella.