Quality Assurance Programme - raw meat – for further processing plants supplying a fast food chain

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Summary
The main subjects of the quality assurance system in Esca are:

1. Specification
   A detailed specification for the products is available for suppliers. The specification covers
   besides the products we buy (meat) also the production of these products including animals,
   husbandry, animal welfare, feeding, transportation, slaughtering and processing.
2. New supplier approval
   Before new suppliers can sell products to Esca, the whole production chain is evaluated by a
detailed audit procedure (hatchery, farm, feed mill, catching and transportation,
slaughterhouse, deboning facility)
3. Test phase
4. During a test phase the physical and microbiological quality of the product is monitored
   thoroughly and any defects or noncompliances are reported back to the supplier in order to
   improve the quality to the required standard.
5. Monitoring
   When a new supplier is accepted for regular shipments to Esca, all deliveries are monitored for
   various quality parameters using a sampling plan. Results are always communicated back to
   the supplier. The results of the quality controls are the basis of the Esca “Supplier Evaluation
   Quality Rating System”.
6. Audits
   Regularly audits are carried out by Esca as well as by independent bodies in order to verify the
   compliances with the standards for GMP, HACCP and Traceability.

Introduction
During the last 20 years the production and consumption of “value added products” has increased
considerably, especially in the poultry sector. As consumers are relatively “far away” from the original
production of meat, the producers of further processed meat products must sell products that meet the
expectations of the customers concerning quality, price and food safety. The responsibility especially
for food safety has moved from the consumer more and more towards the producer and this lead to
the implementation of more or less detailed quality assurance programmes in the meat processing
industry. The following paper will describe the quality assurance programme for chicken meat of Esca-
Food Solutions, a company that is active in beef and chicken further processing.

Specification
A specification for the raw material a company is buying for further processing is the key point for a
quality assurance programme. There must be an exact definition for the various products, for example
breast meat: There must not only be details available like half filets or butterfly-filets, with or without
inner filets, but also a description for trimming the filets, which parts can be included or must be
excluded. In addition it is very important to have a detailed “tolerable defects guideline”. In case we
buy boneless chicken breast meat, we must define what still can be accepted and what has to be
rejected in case a limit has exceeded.
Besides an exact description of the product, physically and microbiologically, we also specify the slaughterhouses and deboning plants (EU-approval), the chilling procedures, the deboning procedures, the type of animals (only broilers), the packaging and transportation of the products, the feeding requirements (no antibiotic growth promoters, genetically modified soybean meal and corn below 0.9%, no animal protein except fish meal, no poultry fat. Especially with feeding it is important to recognize the requirements of the country where the products are sold, because this could be different from country to country, also within the European Union.

Traceability is one of the most important tools to guarantee food safety or in case we face problems to eliminate unsafe products. Every single packaging unit, normally a container of 600kg of meat, must have the information about the broiler farm or farms, feed supplier for this farm, hatchery of day old chicks for this farm, the parent flock or flocks that produced the hatching eggs and the feed supplier for the parent flocks. In addition the meat supplier must have the records of medication and vaccination for the relevant broiler flocks.

In addition to the different requirements for meat and the live bird production, there must be also a detailed procedure available how the products are inspected at the further processing plant. As normally not 100% of a shipment can be checked or inspected, a good and representative sampling procedure must be available. These samples must be inspected and rules must be laid down what to do in case the requirements are not fulfilled (rejection or reworking a complete container or a complete shipment).

Approval of new suppliers
To find a new or additional supplier for meat seems to be easy, because most of the companies are trying to sell their products on a market with many competitors. But as very often the easy way is not the best one. So we decided to have a kind of approval system with different steps to be carried out.

A representative of our company will visit the new supplier and will explain and discuss the above mentioned specification for meat and the deliveries. Then the facilities for slaughtering and deboning, chilling and storage are inspected. In case this visit is positive and a first impression shows that this could be a future supplier, we will audit the company facilities including the feed mill. We will take a feed sample and analyse it for different parameters according the feed specification. If the company passes the audit we organize some small quantities as test-productions. During this production, normally a representative of our company will be present during the production. The meat is shipped to our factory and will be inspected thoroughly, that means that the whole quantity is completely checked for physical defects, and microbiological tests will be carried out. These results are communicated back to the meat supplier in order to improve the quality in case it is necessary. After a series of test-productions the quality is rated according our rating system. When the score is high enough, regular production can begin.

Test phase
After the initial test shipments there will be a longer test phase with normal quantities, that means weekly deliveries from around 5 to 15 tons or even more. The quality of the products is still closely monitored and feedback is given to the supplier. During this time, the supplier will be audited by a independent company. During this audit the GMPs (Good Manufacturing Practices), the HACCP-system (Hazard Analysis Critical Control Points) and the Traceability-System are checked. This is a requirement of our customer. When this audit is passed and the quality rating meets our requirements the supplier is e regular supplier and placed on the supplier list of our customer.

Monitoring
Monitoring of physical and microbiological parameters is the most important tool in a quality assurance system. Only the application of a strictly enforced system of receiving checks for raw material gives you confidence that the raw material will not be the reason for complaints from the customer. The results of the checks must be available very quickly in order to block raw material that might be contaminated with foreign bodies, bones or does not meet the specification for other parameters. The samples for inspection must be collected according to a sampling plan which gives you a representative sample of the shipment. We have this in place for physical parameters. Every container with app. 500 to 600 kg meat is sampled for physical parameters. Every shipment is also sampled for microbiological parameters. But as it is very difficult to have a representative sample from the whole
shipment, we sample only randomly chosen containers per type of meat (regular suppliers). When data show increased plate counts from the last shipments, the sampling frequency is increased, that means we sample more than one container or even we sample all containers of a shipment until the data are back to normal.

The following steps are carried out during reception of meat.

**UNLOADING**

The sealed transport truck is opened and inspected for cleanliness and the presence of wooden pallets and other material. In case other products or wooden pallets are on the truck with our products, unloading is not possible. The whole truck is rejected.

The containers are then inspected for cleanliness, correct labelling, correct packing (no overfilling), date of kill and correct traceability. Every further processing plant has a list with raw meat suppliers, their approved feed mills and with approved products. Then the container will be weighed and opened, the appearance and the smell of the meat is checked and the temperature is measured. In case the appearance and/or smell is not good or the temperature is too high or too low, the container will be blocked. A blocked container will not go to production until it is released or it will be sent back to the supplier.

**SAMPLING**

From all containers that were unloaded, a representative sample of 20kg is taken with a special device. At the same time from other containers samples are taken for microbiological analysis. The 20kg samples are then checked manually for physical properties like skin, fat, tendons and for foreign bodies like feathers, bones, cartilages, plastic and so on. In case the sample meets the specification, the container is released for production, otherwise it will be completely inspected or sent back to the supplier. The results from microbiological testing are only available next day. But the final product is kept in storage until the results are present. In case there was a deviation in raw material (high plate counts, above the limits) the final product will be sampled in addition and only in case the data are o.k., the final product will be released.

**RATING**

All the data from raw material inspection are recorded and processed. For each container, each shipment and every month a grade is calculated. There are four grades (A, B, C, D). Grade "A" is the best quality. In case a supplier gets a Grade "C" in a month, then the following month the quantity can be reduced to 50% of regular shipments. The supplier has to solve the problems that led to the lower rating. In case a supplier received a "D" rating in one month, deliveries must be stopped for 4 weeks. The supplier has to go through the whole procedure for the approval for new suppliers.

The grades are calculated by deducting points for each non-conformance found in the samples taken for inspection during unloading. A container with no defects or non-compliances has 100 points. Each defect leads to a deduction of points according to a table (for example: a feather means 50 points deduction, a bone >13mm means 100 points deduction).

**Audits**

There are many audit schemes available in Europe like QS (Qualität und Sicherheit) in Germany, ACP (Assured Chicken Production) and BRC (British Retail Consortium) in UK and IKB (Integrale Ketenenbeheersing) in The Netherlands and others.

All Esca plants in Europe work with the same specification and with the same audit system that we have developed together with our customer. We laid down requirements for slaughtering and deboning (GMPs), HACCP, Traceability and Animal Welfare for growing broilers, catching and transportation and for stunning and killing. From these requirements checklists were developed. These checklists are focussed on assessing especially the production and food safety aspects. All slaughterhouses and deboning plants will be audited at least once per year for GMPs, HACCP, Traceability and Animal Welfare at slaughter. There is the same system for rating as lined out for raw material intake. In case a plant gets a "C" rating, the plant has to audited within a certain time once again. In case the plant gets a "D" rating, deliveries have to be stopped immediately.
In addition to our own auditing system, our customer requires an additional audit from independent companies. These companies (like Efsis, SGS) use the same checklist and requirements and audit all listed suppliers once a year. As the audits are carried out by different persons, it is necessary to have meetings with the auditors on a regular basis in order to align the different opinions.

Animal welfare

As it is impossible to audit all farms of a supplier like slaughterhouses, we demand from our suppliers to check each flock for a number of welfare indicators that reflect the conditions on the farm as well as the conditions and handling during catching and transportation. Farm specific parameters are hock burns, foot pad lesions and breast blisters. Handling and transportation related parameters are DOAs (dead on arrival), broken wings, broken legs and bruising. At least a sample of minimum 100 animals have to inspected from each flock and the parameters have to be reported to Esca.

In case we find out that some parameters tend to increase above specified levels, we will inspect farms or carry out animal welfare audits.

Animal health

Animal health on broiler farms is a very important factor for Esca, because only from healthy animals you can produce save and healthy meat products. Of special concern for our customer is the use of antibiotics. So we decided already from the end of 2001 that all our suppliers had to withdraw antibiotic growth promoters. Already from beginning of 2001 we started monitoring the total antibiotic consumption of all flocks that were used for raw material production for Esca. So far we could not see an increase in therapeutic use of antibiotics. We found out, that the use of antibiotics varies significantly from country to country and also from season to season and from supplier to supplier. The whole issue is quite complicated and dynamic and there are no easy methods available to reduce antibiotic consumption in broiler production. This is only possible when all factors are taken into consideration from healthy and stress-free parents and high quality day-old chicks, well balanced feed, good housing conditions and good husbandry practices on the farms.

Feed and feed mills

If you recall the food scandals of the last 10 years in Europe, mostly feed was the origin of the problem. So we decided some years ago to approve feed mills. We developed an audit procedure and a feed sampling procedure. We (and also the listed feed mills) take regularly feed samples from feed mills or farms, check the ingredients and other specified parameters like absence of antibiotic growth promotors, animal protein, GMOs and others. We defined also rules what to do when one or more parameters are out of specification.

Results and conclusions

The following graphs show the development of some parameters during the last years.

Especially the bone content is of great importance for customers and producers. We see more and more complaints because of bones found in a product. Customers do not only complain, but they try very often to get some compensation for pain, dentist bills and so on.

Figure 1 shows the development of contamination with bones and cartilages from 1990 from a specific supplier (A). There was a continuous decline in bone content over the years. The deboning operation was totally manual (cone line). Supplier B operated the same system and we could see also a decline in bone content. In 1998 this supplier changed the deboning system to semi-automatic and in 2000 to fully automatic. It is clearly visible that the contamination increased when the supplier started with a new technology and that it takes some time until the system is working correctly and the and the quality is back to “normal”. The Figures 3 and 4 illustrate the rejections of the same suppliers. Supplier A had a good correlation between bone content and rejections. With supplier B the correlation with bone content was not as high as with supplier A. This means that supplier B had more other reasons for rejections. So it is important to combine different parameters and calculate a “quality level” or “grade”. Figure 5 illustrates this. Although the bone content was higher in 2001 compared to 1997 (supplier B), the rating was better in 2001.

In conclusion I would say that a constant and good relationship between supplier and further processing plant (customer) is necessary in order to keep quality at a certain level. It will happen that...
this level will be not maintained always at the same level, but the tools we have give the opportunity to reach the required level in a certain time. It is also not possible to monitor and check everything. So one must take into account, that there will arise problems with quality issues and one must be prepared to deal with these problems including recall procedures.

**Figure 1: Bones and Cartilages, Supplier A**

**Figure 2: Bones and Cartilages, Supplier B**

**Figure 3: Blocked containers, Supplier A**
Figure 4: Blocked Containers, Supplier B

Figure 5: Quality Rating