

QUALITY MANAGEMENT AND FACTORS ON POULTRY PATHWAY

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Abstract

In poultry production, quality and quality control require good management throughout the entire production chain to follow performance upgrading and therefore increase profitability, and secondly the achievement of some products appropriate to the standards. People involved in poultry production must realize that the main purpose of the entire production system is customer requirements satisfaction. Improving quality is possible when all the stages of production of poultry meat are incorporated in the quality control methods and those methods are simple and practical.

Key words: management, quality, poultry pathway

INTRODUCTION

Poultry production system for the finished product, poultry must be viewed as an integrated system, from the breeding farms to the food itself.

All stages of production affect the quality of meat by their specificity and which, ultimately, may lead to improvement or impairment of quality.

Each stage of production is basically a manufacturing process and final product quality and efficiency, in each stage of production, depends on the quality of raw materials, degree of staff training, specific consumption and technology with which are working. Quality control must begin with inputs control at each stage of production (raw materials for feed, hatching egg quality, quality day old chicks, feed quality, etc.) and must be maintained throughout the entire production process..

A poultry pathway is composed of the following: manufacturer of hybrid (genetic), producer of hatching eggs, hatching, farming of laying hens / broilers farms, nutrition (feed mill combined) the veterinary services, slaughter (collection stations, packaging);

processing - packaging - distribution - sales meat consumer.

These stages affect each in part the meat quality, ultimately resulting in improved quality or its depreciation.

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Quality is given by a complex of features, namely:

- ❖ *usage features:* specific consumption, duration of consumption, consumption volume;
- ❖ *attributes:* brand names, requirements related services;
- ❖ *symbolic content* (consumer and even companies buy at the same time with the merchandise certain symbols): power, freedom, comfort, performance, etc;
- ❖ *quality characteristics:* components / composition, technical and functional characteristics, safety features (Figure 1, Table 1).

Table 1
Factors determining the quality

Factors determining the quality	
	- research and designing
	- raw materials and materials
- in production process	- technological process
	- professional qualification of employees
	- assurance and quality control
	- standards and norms
	- packaging
- in the merchandise circulation domain	- transport
	- storage

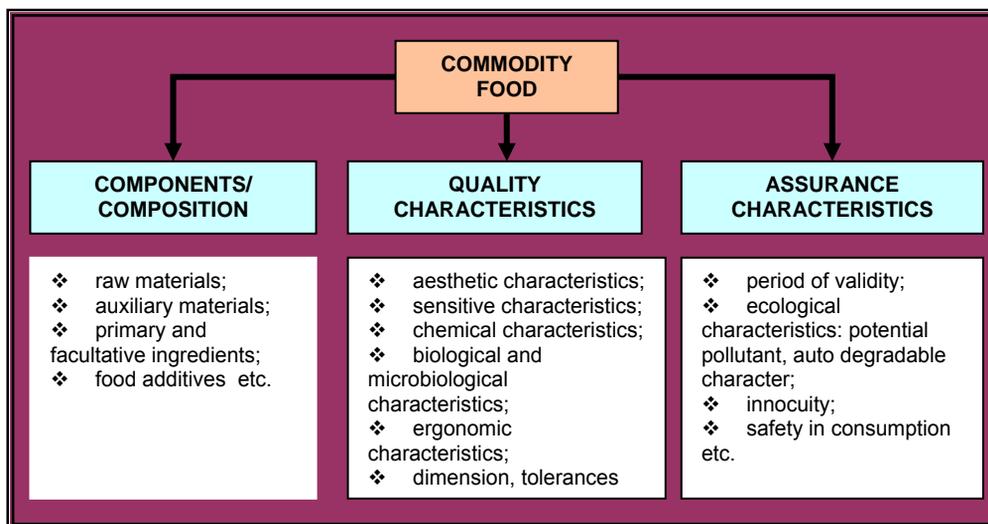


Figure 1. Quality characteristics

If we consider the content analysis of "quality" of the food, we see that is not at all simple. And that, primarily because many aspects (defining quality) are subjective (includes psihosensitive characteristics, ethical-moral and religious perceptions) and, secondly, because there are different points of views regarding content quality belonging to many categories of interested factors (for meat: farmer, zootechnician, veterinarian, hygienist, dietitian, industrial processors of meat, trader, buyer).

For each category, the term "quality" has a certain specification, namely:

- ❖ for producer - meat should be well accepted in the market and obtain a good profit;
- ❖ for zootechnicians - is quality meat from animals with high index of convertibility, with corresponding psihosensitive characteristics;
- ❖ for veterinary - quality meat comes from healthy animals with an optimal nutritional status;
- ❖ for industrial producers – quality meat should condition the achieving of industrial products with commercial value;

- ❖ for the hygienist - quality meat should not be contaminated microbiologically, should be adequate sanitary standards;
- ❖ for dietitian - quality meat should have a certain proportion of substances with high biological value, not to possess antinutrițional compounds;
- ❖ for the dealer - quality meat is that which satisfy the requirements of each category of buyers, sells quickly and ensure a good profit;
- ❖ for buyer - quality product means aggregation of hygienic requirements, dietético-nutrition, psihosensitive, ease of preparation and a satisfactory price level.

Quality should not be solely the concern of specialists in quality domain or a quality

department, but a concern of each worker's production company. This aspect is emphasized in the contribution model of the four Q, under which its final quality has the resources in the work of each individual, there are four major types of quality - the four Q- at which can contribute the staff: quality design, quality production, quality distribution and national quality.

MATERIAL AND METHOD

The strategy of assurance lots quality of food is based on the correlation between the prescribed quality assurance, ensuring the safety and quality assurance tools (Figure 2).

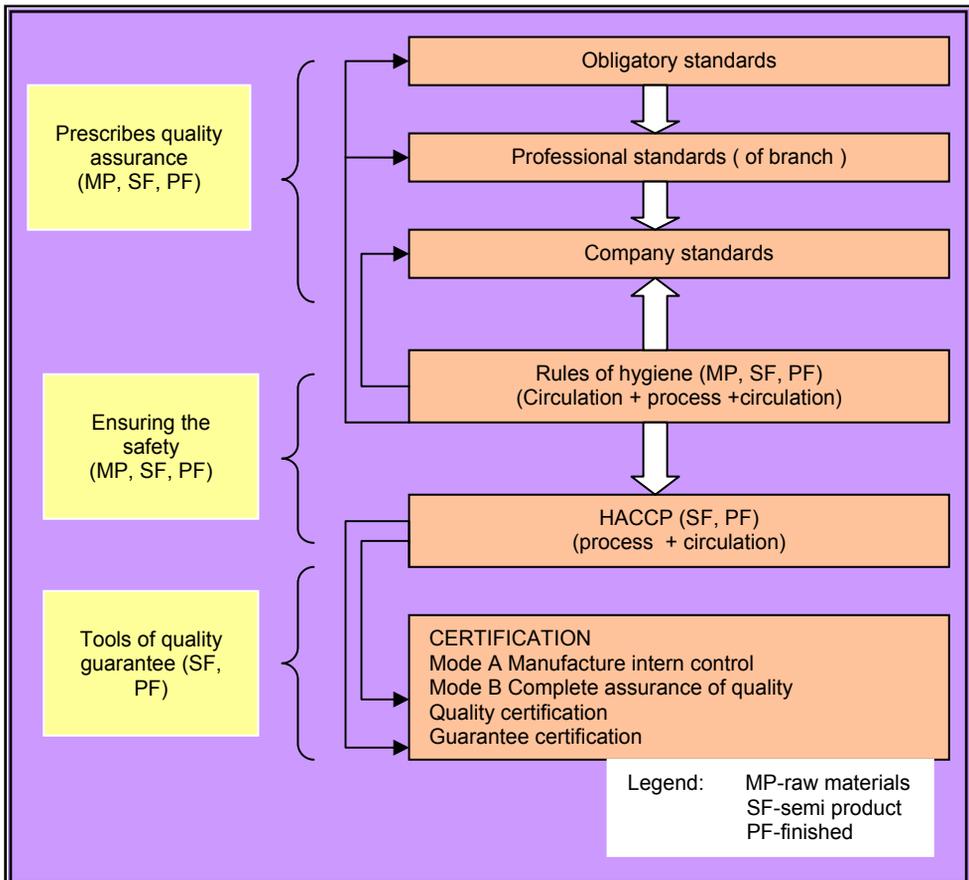


Figure 2. The correlation between prescribed quality assurance, ensuring their safety and tools to ensure food quality

In food domain attestation of quality is strengthened by HACCP system (Hazard Analysis Critical Control Point) which would ensure the safety of the products. Even if it is not about compulsoriness regarding ISO family implementation in business in the EU, standards play an important role helping to create a single market through a series of laws merged into the New Approach directives. Standardization of our country is poor as part number, but begins to see a growth of firms that have realized the important role that standardization offered.

A key tool in this regard is the application of HACCP (Hazard Analysis Critical Control Point) in the production and marketing of foods.

The emergence of the HACCP concept was favored by the huge advances made in science and technology in recent decades, the system was first devised in 1959 by the Pillsbury Company in its research projects and making food for U.S. space programs.

HACCP method was presented in public at the National Conference for Food Protection in 1971, being subsequently adopted by FDA (Food and Drugs Administration) for inspection of civil food businesses.

As its evolution, this system has proven its important role in obtaining and marketing of food products safe for human health, claiming its practical valence in ensuring their safety in public alimentation, food industry, tourism and trade. Meeting on Food Security in Europe (Brussels, 1989) problems have devoted HACCP as a useful instrument in implementing and ensuring it.

Codex Alimentarius Commission encourages the implementation of HACCP method at the level of economical agents and its regulation by an appropriate legislative framework in the Member States. In this regard, recent EU legislation recommend the application of quality management systems based on HACCP in countries wishing to export food to the European Union.

HACCP systematize all the basic provisions of sanitary inspection, proved to be a simple and effective way to achieve control and self-control on the food hygiene

line. Currently, there are trends and initiatives emphasized that, in the various enterprises, application of HACCP to be made using electronic means of monitoring and processing of information, elaborating programs suitable to their activity.

Systemic approach to achieving food security for consumption of food consist in applying seven basic principles:

P1. The evaluation of the risks associated with obtaining raw materials and ingredients, processing, handling, storage, distribution, preparation cooking and food consumption.

P2. Determination of critical points which can control the risks identified.

P3. Setting critical limits that must be respected in each critical control point.

P3. Setting procedures to monitor critical control points.

P5. Setting corrective actions to be applied when after monitoring critical control point is detected a deviation from critical limits.

P6. Organizing an effective system for keeping records which constitute HACCP plan documentation.

P7. Establish procedures that will verify that the HACCP system is working properly.

The checks are meant to confirm that, following application of HACCP plan, all risks have been identified and controlled.

Quality control must begin with inputs control at each stage of production (raw materials, egg quality, chicken quality, feed quality, etc.) and must be maintained throughout the entire production process.

Quality factors in the producers of hybrid

Companies producing broiler chicken have a great impact on quality of poultry meat because important parameters, such as the ratio meat / bone, chest carcass weight, carcass fat weight, are largely genetically determined.

Also, attention should be given to broiler product conformation, being preferred the one that is short on legs and wide chest. To avoid higoamelor chest, which greatly devalues the quality of the carcass. Manufacturers of hybrids should consider obtaining broiler with strong skeleton with a good plume body.

Quality factors in the hatching egg producer (breeding farm)

At the reproduction farm, the main objective is to achieve genetic potential provided by the improvement companies.

Management of the hall has great influence in maintaining the quality of hatching eggs and indirect of chicks produced (vitality and their performance). At this level, influence on meat quality for consumers is still low.

Because egg hatching plays a major role in transmission of microorganisms, should be given special attention to farm insulation and proper application of procedures for cleaning, disinfecting, disinfesting and disinfestations and sanitizer eggs according to technology.

Health surveillance of breeding herds by detecting clinical and subclinical disease, and avoid stress of any kind are particularly important in achieving a quality finished product.

Quality factors in the incubation station

As in the breeding farm, hatchery management can influence the quality of chicks, which in turn affect the vitality and performance of broiler lots. Again the quality at the consumer is least affected at this level of production.

Incubation is an important link in the transmission of microorganisms, dirty or infected eggs placed in incubator at 37°C in combination with humidity in the incubator can be a source of infection for puppies.

Special attention should be paid to cleaning and rigorous disinfection of hatching station as a whole. Key issues requiring special controls are cleaning eggs, their handling and transportation, for this is required a team of highly trained workers.

Quality factors in the breeding of broilers

Management in the breeding halls of broilers may influence the nutritional value of broiler carcass as:

- ❖ hall temperature affects intake, energy requirements and waste energy that is converted into fat deposits;
- ❖ temperature after start affects report white meat / red meat;
- ❖ bird density will influence the development of feathers and litter quality;

- ❖ a bad litter leads to the formation of the joints and chest higroame;
- ❖ catching birds in the hall and transported to the slaughterhouse can cause visible defects to the carcass such as bruises or breaks in the wings, legs and chest, but also invisible defects inside the case.

Bacteriological problems of poultry can appear in breeding halls.

Microclimate from halls and litter plays an important role in the survival and multiplication of pathogenic microorganisms and by their transport to the slaughterhouse can be extended contamination by feces of means of transport. For this reason, the forage position before slaughter should be done properly to minimize contamination by feces during transport and at slaughter during evisceration.

Unwanted residues of feed additives and medicines are other factors that may affect meat quality. It is important that the recipes used in the last phase of growth (finisher) do not contain feed additives and medicines are not used in the last period of growth. If the abattoir is integrating, farmers must inform the slaughterhouse about the medication made during growth for the slaughterhouse to take preventive measures if necessary.

Each breeding farm should aim to increase the delivery of a large number of quality chicken. For this are identified seven factors that influence the quality of chicken and is required a careful control throughout the entire chickens breeding period: chicken a day: hybrid, quality, weight and uniformity, status veterinary, mixed fodder: its quality, bedding: litter type and quantity, air: proper ventilation is one of the key factors, water: is the most neglected nutrient and therefore quality control is required, the vectors for spreading disease: humans, animals and vehicles, isolation sanitary - veterinary and insurance microclimate optimal in breeding halls.

Concerning nutrition chicken meat, it can greatly affect quality: ratio of meat / bone / fat: is strongly influenced by nutrition, fatty acid composition, meat color, flavor poultry, carcass fat.

Quality factors in the factory production of compound feed

In the combined feed factories, special attention should be given to the following aspects:

- ❖ nutrient content at the level of hybrid requirements or even of gender in order to achieve genetic potential;
- ❖ balance recipes: balancing energy / protein and vitamin / mineral content of the amino acid balance;
- ❖ monitoring raw material: in terms of nutrition, bacteriological contamination, mycological, pesticides and heavy metals;
- ❖ sanitation feed: thermal (steam) of feed and fodder granulation or only granulation feed.

Quality factors in the slaughterhouse

Commercial aspect, presentation and appeal of meat, poultry, depend heavily on slaughter, processing and packaging. On the flow of slaughter before the meat supply, there may be several stages of incorrect application of technology or lack of appropriate technologies.

At the stunning, which usually run electric, bleeding may occur (due to rupture veins) in the form of spots in the muscles of the chest and upper legs, leading to downgrading of carcasses. The problem of damages caused by electrical stunning is old in poultry industry, with large variations between different lots, or even between birds of the same batch. It is recommended careful monitoring of the various hybrids, farms and lots of birds, in order to minimize these shortcomings.

Bleeding, the birds lost approximately 45% of the total volume of blood, if bleeding is complete. The remaining blood remains in the housing, much of it in the guts. Incomplete bleeding means the loss of only one third of the total volume of blood, which does not affect the nutritional qualities of carcass, but affects its appearance with red color at the meat and skin.

Breaking blood vessels near the bones of legs and wings affect the quality of cooked carcass.

Acidity and stiffness post mortem: after slaughter the pH of the muscle decreases due

to the installation of lactic acid in muscle mass. In breast muscle pH decreases to 5.6 to 5.9, and pH of muscles from legs decrease until 6.1 to 6.4. Decreasing pH prevents bacterial growth and allows maintain quality meat for longer (breast meat retains its quality for longer than meat legs). final pH can affect meat quality (tenderness).

A bird that has been under stress before slaughter may have a small reserve of glycogen in the muscles making the pH to 6.4, and the meat to be dry, hard and dark. High pH doesn't allow degradation of muscle protein and meat remains strong and unattractive.

Whole carcass should be in postmortem rigidity to have a tender meat.

Cutting the carcass before installing rigidity makes meat tough. Also if it is frozen, then thawed and cook until the stiffness to install, meat remains strong, and the phenomenon is called "cold shortening".

Muscle temperature: after slaughter may affect the rhythm of entry into the post-mortem rigidity. A temperature above 20°C causes an excessive contraction of muscles and a quick release of glycogen. Cooling carcass at 4°C after evisceration, with air or immersion, but never below 0°C is recommended. Cooling below 0°C leads to loss of calcium ions in muscle, the meat shrinks and becomes too tough.

To minimize the bacteriological load in the finished product, the main actions that may be taken are: preventing contamination from a batch of chicken to another, checking the main points of risk (cooling deplume, evisceration) regular testing in terms of bacteriological load in various stages of production and finished product, controlling temperature throughout the distribution system.

Production of meat of good quality is the result of achieving technological and veterinary performance. Already, the poultry breeding hall, from catching the foot and introduction into cages for transport to the slaughterhouse, deficiencies may occur.

Catching tough provoke injuries occurring on the case culled. Any damage, bruising (bruising) produced within 24 hours before

slaughter, is transmitted and held on the meat produced. At the birds well developed is significantly reduced the rate of injuries caused by catching, loading and transport. Common area of injury has the following distribution: 42% breast, wings 33%, 25% legs. The catching and loading in cages in poultry breeding hall, is recommended usage of safety lighting with blue or red light or failing that use a maximum of 15% of the normal front lighting.

The density of birds in cages for transport is also of particular importance, especially when we have temperatures in excess (hot periods in summer). During afluirii to the slaughterhouse, exposure to excessive temperatures (heat-summer and frost -winter) causes a strong stress to an increase in mortality over 1%.

Long-range transport chickens (6 hours) lead to weight loss hard to live (an emptying of the digestive tract, dehydration) at a rate of up to 1% and also increased mortality.

Quality factors in the distribution – sales sector

Monitoring the distribution must be carefully made, with emphasis on the ultimate control of the product distributed and sold.

During distribution, until the product reaches the consumer, there may occur changes in optical quality, or nutrition, for the following reasons: inadequate packaging; temperature during distribution and sale outside the limits of technology, the "first in - first out" should be displayed and respected both at storage and sales, which together with rigorous control of the stock of meat allows not only the declaration of the warranty period, but also the guarantee of this period, exceeding the validity etc.

Distributors and dealers are in permanent contact with consumers and they should provide general information about the product. They should receive information on all stages of production, but especially about genetic, slaughter and eventually nutrition. Loss of confidence in the quality of the product is primarily due to lack of information, which may generate assumptions and speculations. The buyer

must be sure that there are not risks consuming a particular food.

Factors affecting poultry meat quality after slaughter are: packaging, marking, labeling, transport, sales and marketing presentation.

CONCLUSIONS

Approaching security of a product in the poultry pathway level allows obtaining a efficiently management with identifying weak links in the chain which may help the emergence of risk.

Responsibility for quality assurance lies with all parts taking part in the composition pathway.

Improvement HACCP programs at this level have to support on the conception and distribution of some systems for risk analysis and traceability adapted to the needs and constantly reviewed.

Managing risks that impose the quality can be achieved only by taking into account the components of the pathway of production and capitalization as well as all factors that can influence the quality of the finished product (poultry).

Public health and individual health can be improved in the poultry pathway by implementing a complete management system that to corroborate the registration data with the risk analysis at each link.

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