

USING OF ANTIMICROBIAL AGENTS (ESSENTIAL OIL) FOR MICROBIOLOGY POULTRY AND ITS PRODUCTS

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Abstract

Recently there is increasing of the consume of the poultry product in the World and European market. The above consume is now related with the tendency to buy and consume healthy food products. Group of populations that consuming poultry products industry searching them safety and guarantee. The pollution of fresh and packaging poultry meat and other poultry product derives from the environment and from the operating procedures applied in the companies of the production. The evaluation of their safety and quality involves also microbiological analysis of control, as an important part to evaluate and manage the risk, originated from the microbial strains presented there. In this framework, there are realized many scientific studies using natural antimicrobials (essential oils, drizzle etc..) to reduce the microbial load of the poultry products.

Keywords: safet, pollution, and packaging poultry meat, natural antimicrobials

1. INTRODUCTION

Albanian consumer is increasingly aware about the influence of consumed food products on its health. Now depending on options selected individual food products quality and a reasonable price, which identifies a real purchasing power of consumers. In large group of edible (eatable) food products from Albanian population are parts of the chicken meat. Their consumption of poultry products, more and more has been raised. Albanian production of the poultry industry, which includes meat and poultry products are packaged or not going along with products imported poultry industry. Competition requires a clear system of full control of the certification. Quality, safety and control are required to take place also referred to the law “On Service and Veterinary Inspectorate”[1].

Selected subject is part of a set of studies that EU countries have undertaken, taking into account the widespread use of these products in all countries the world. Group of populations that consuming poultry products industry searching them secure and guarantee. Being makes food protein products of the poultry industry more attractive to the action of microorganisms, due to possible contamination microbial, including bacteria pathogens.

Displaying of microbials is connected among other things by using the storage for a long time in refrigerator temperature, while the internal temperature did not reach those values that provides the cooling medium. Pollution that can happen is connected with existence of bacteria on the body itself. Key in this group is *Clostridium perfringens*, belonging to the *Clostridium* family, genus *Enterobacteriaceae*.

2. MATERIAL AND METHODS

Main research organization listed as follows:

- The factors affecting the growth of microbial load in a poultry farm product, that consumers be offered safe.
- In finding ways to intervene in the process of colonization of *Salmonella* inside the chicken digestive apparatus and to minimize the dissemination of microorganisms colonization in other edible (etable) parts using factors with antimicrobial nature.
- The development of control procedures to prevent *Salmonella* contamination in eggs of birds using chemical substrate for this purpose along with microorganisms antagonistic to pathogens or both.

- The use of vaccines, antagonistic microflora, diagnostic and epidemiological tools to identify and describe the links between pollution levels in the poultry farm with the final product pollution of new technologies to allow the distribution of safe consumer products and high quality. [2, 3]

This is accomplished through:

- Improving microbiological quality at the end of manufacturing process poultry for consumption, using new methods of microbiological identification and taxonomic studies on identified microorganisms.
- Improving the level of cleanliness and hygiene facilities in areas of work, using for this purpose and the use of modern technologies with biofilms.
- Development of efficient methods to determine the point of finite temperature at which meat or poultry products should be treated to ensure the final product in accordance with the standards where it is reached full destruction of pathogen microorganisms.

These programs ensure efficiency in the veterinarian part of poultry product (growth, slaughter), in technological processes, including packaging and final product quality, which used the phrase "Ready for Consumption".

Monitoring realized for changes that undergo pathogen microbial load or not, in living (alive) chickens, slaughter chickens and the carcass of the products ready to be consumed. A typical example is trace of *Salmonella* levels on the use of 17 different substances and *Campylobacter* levels in used of 8 substances with antimicrobial nature. The most important point of this type of study is the determination of smaller concentrations of antimicrobials that inhibit action of harmful microorganisms mentioned above. In *Salmonella* group are made microbiological and genetic studies on *Salmonella typhimurium* DT 104. Microbiological studies have focused on the overall burden and changes in the presence of antimicrobials and effects on product ready. Studies of this kind are carried out in working

group with specific direction specialists, who have used the experience in the field of monitoring of loads in the presence of antimicrobials having intended to provide full data on the presence or not of *Salmonella* or other enteric microorganisms, identify areas of detailed studies, provide statistical material that serves as experience for the future. The main objective of the current research work is to reduce the level of resistance of pathogenic bacteria and their distribution.[1]

3. RESULTS AND DISCUSSIONS

Sample that offering the Albanian market analysis is varied. So it became a choice, two samples were used, poultry Korça "Boboshtica" and Patos. Samples are coming from two different areas of the country which together with product offer changes that are reflected in the variety, hygiene, safety and packaging. Samples were analyzed initially untreated and then treated with antimicrobial agents. Samples taken for analysis were not treated during the control in fully way because the theoretical data accept significant changes in microbic load moving from those surface areas in the interior. From literature accepted that the inner part offer due to structural protein and composition in a burden greater than the surface area at which the influence of environmental conditions and the existence or not of sufficient amount of adipose (fatty) tissue. Pull attention to the neck area often has a load several times greater than other areas. Likewise, the interior areas within or away from the main bodies represent different microbial loads. To create a complete picture of particle analysis was certain: the surface, interior (part of the thighs, white meat and organs near the area, part of the neck). The results obtained will serve to create an analysis group in particle surface or interior yet to pass detailed later in taxonomic studies to genus and species level based primarily on TVC (Total Viable Count). As noted above, selected sample is not enough to reach in conclusions but is a track that can be extended (continued). Microbiological control was carried out in view

of the control methods are offered at book.[3, 4, 5]

MPA (Meat Pepton Agar) was used grounds for bacteria, YM-broth for yeast. This ground was selected because it is known for effective results for bacterial and yeast load. Capek ground which due to natural preparation without using antibiotics against bacteria offered after 24-hour and 48-hour bacterial load. Dilution method was applied, respectively: 1:10 (first dilution), 1:100 (second dilution), 1:1000 (third dilution). It was worked with two parallel for each sample and control results was made after 24-hours, 48-hours and seven day for mold. Each particle of specified of selected product were analyzed in the same manner to provide opportunity to compare the results. On the same grounds and the same method was applied and in treated samples with antimicrobial agents, interpretation of the results of which will be given detailed in this experimental section. The road selected for the experiment described above provides the first data, continuation of group experiments will be conducted to position of part taken for analysis. Results of the experiments for untreated samples are presented in full in Tables 1 and 2 which were interpreted graphically. Table 1 have presented in detail the microbiological assessment of Boboshtica chicken. Microbiological control to identify product safety was analysed in leather chicken(surface), part of organs (interior), part of the thigh, part of digest apparatus. It is made this division based on anatomical data in the literature on control of surface and interior changes and the surrounding area generally digestive apparatus, the latter associated with significant increase of substrate microorganisms. Interpretation of the results presented in table 1 provides experimental data that match those of the theoretical literature. Parallel plates offer tolerance which are acceptable and understandable to the microbiological analysis. There are significant changes when crossing from first dilution in the third, when crossing from one part taken for analysis to another. Particles represent a significant bacterial load clearly identified and

a majority in the area near the internal organs. There is a relatively small load of bacteria in the thigh area and a normal bacterial load in first dilution of surface (skin). Over time the storage of 24 hours to 48 hours microbial load of surface varies significantly, grow rapidly and dominate pigmentation bacteria with yellow and red pigment.

Capsule-former bacteria observed in some cases, especially in ground YM-broth. Maybe this is related to the role of particular carbon sources present in the ground. Ground YM-broth offers a very limited bacterial load that expected from literature and also a bacterial load to show up in the first 24 hours where bacteria growth is mostly colorless, unpigmentation. In the area near the internal organs in contrast to other particles resulting yeast with a pseudomycel significant development, which observed neither on the surface nor inside. This is expected because of the huge load inside organs of chicken. While YM-broth ground provides us symbiosis yeast-bacteria in a limited number but not yeast with pseudomycel. Among the colonies of molds development significantly mention surface but with the surrounding environment *Mycoret* on surface that may not be related to the, genus *Penicillium* and *Aspergillus*.

Number of colonies *Mucor* in the first dilution is very large, especially in the surface. This is reason why the interpretation is related to the environment. Thigh area is again a evidently mold load which is completely replaced inside organs with bacteria and yeast with pseudomycel. Table 2 offers the results of the Patos poultry which are prevalent in the capital markets, in other parts of the country. Particals taken for analisys are:1-surface (skin of chicken), 2-interior (organs), interior (digestive apparatus), 3-neck. Interior part is not fully analyzed, but is selected only white meat that is not controlled microbiological in Boboshtica chicken. It is followed the same way with the same ground(terrain) and methods. Since early flaring a large microbiological load compared with microbiological Boboshtica chickens. Given that the production area is known in the university environment because are

development practice with students, considered as a productive area with a high level of hygiene-sanitary loads of the recorder may be related or variety, or food that they used, not the environment.

Identify bacterial colonies on the ground MPA as transparent colorless colonies or pigmentation colonies in relatively great numbers in the first of 24-hours and a countless level in surface and in neck. While the neck area also offers in third dilution 800 colonies on the plate, a number much higher. There are many colonies that formed clear capsule and observed symbiosis within the bacteria.

White meat offers limited microbial load compared with surface and neck. While YM-broth ground (terrain) offers only bacterial but not yeast colonies. Yeast with pseudomycel not observed. Also this phenomenon precedes and a limited number of molds, that observed in the Çapek ground after seven days. There aren't molds on surface and inside, while in the neck is observed *Aspergillus* and *Cladospora* genus.

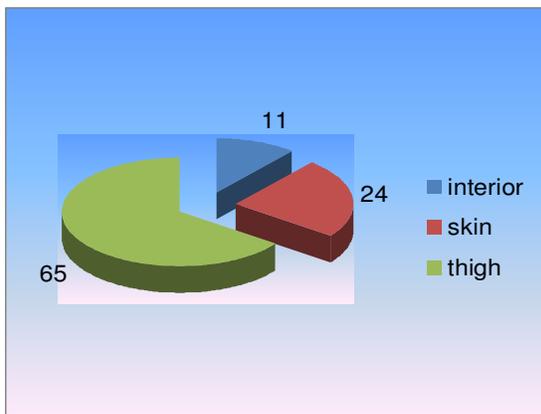


Figure 1. Total microbial load to treated chickens of Boboshtica

Evidenced by the chart presented obvious:

- Higher loads compared to the skin and inside area;
- According to the literature cutter-tools increased artificially the internal load, which not results in any case processing evidence;
- This is related to the hygiene and cleanliness during experimental manipulation

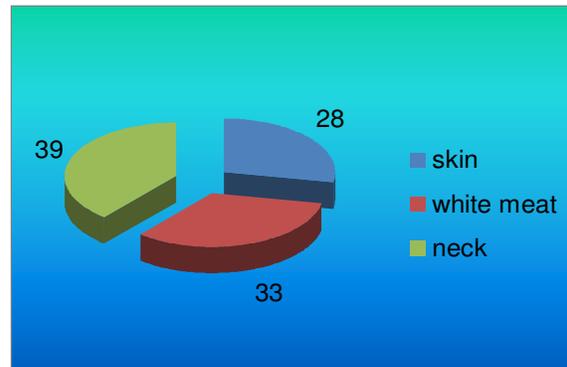


Figure 2. Graphic microbiological load in the Patos chicken, which are treated with natural antimicrobial agent

- The graphical presentation clearly noticed the presence of a significant microbiological load of the neck area, which is acknowledged by the current literature. The loads shown in the graph is much smaller compared with untreated samples. This experiment suggests the continuation to go to detailed results.
- The area of the skin, although contact with the environment, the residence time without packaging, offers to reduce overall load, measurable thanks to reduction, due to treatment with natural antimicrobial.

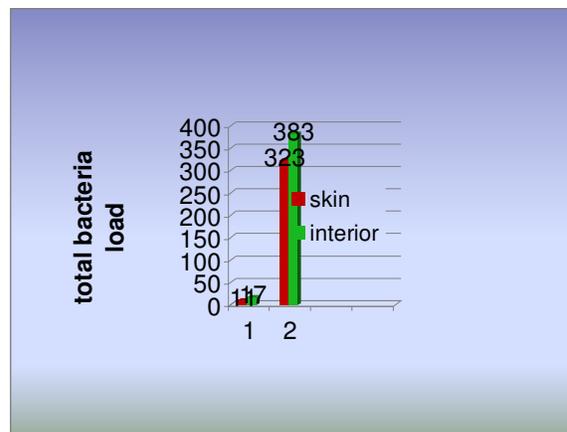


Figure 3. Total bacterial load in Patos and Boboshtica Chickens

Incubation time – 24 hours
MPA terrain (ground)
Seria 1 – Boboshtica chickens
Seria 2 – Patos chickens

In Fig 3 compare the results of microbial load to Patos and Boboshtica chickens, previously treated for the same particle and analyzed in MPA ground.

- From the results presented in the figure 3 clearly recorder the largest of interior when samples are treated
- Treatment has reduced the bacterial load, drastically
- This load difference is very apparent in untreated samples but they are not presented graphically because in many case observed a countless load that may be presented in graphs only conventionally.
- In untreated Patos chicken dominant is bacterial load, while mold load is negligible
- In untreated Boboshtica chicken dominant is bacterial and mold load, where both significantly reduced after treatment
- There are also cases of impropriety, as some of mold load, which are identified after treatment of Patos chicken, which untreated have not.

A reflection of bacterial load and reduced mold load in Boboshtica chickens is shown in Figure 4 (treated samples).

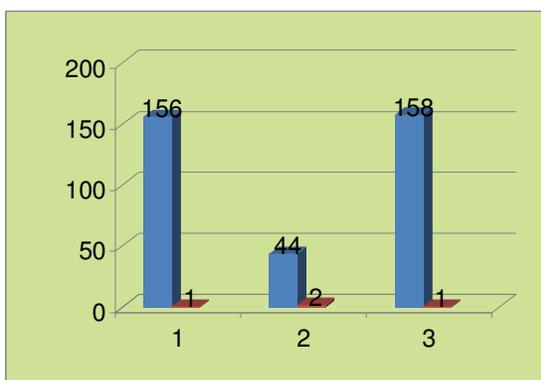


Figure 4. Bacterial, yeast and mold loads in analyzed particles to Boboshtica chickens

- 1-blue – bacterial and yeast load in the thigh
- 2-blue - bacterial and yeast load in interior
- 3-blue - bacterial and yeast load in the skin
- 1-red – mold load in the thigh

2-red – mold load in interior

3-red - mold load in the skin

Analyzing the chart once again appears clear countable bacterial, mold and yeast loads, and drastically reducing the mold load, relatively few in load of interior.

4. CONCLUSIONS

The experimental data of untreated samples have been achieved in many conclusions which are recorder in detail and interpreted the results. In order they are presented and summarized below:[4],[5]

1. Microbial load of Patos chicken is significantly greater than significantly greater than those in the area of Korça. This can be linked with the presence of a high amount of adipose tissue (triglyceride) in the production of Patos.

2. There is a significant change from particle to particle. The surface (skin) offers a small load compared with the inside and the neck area that relates to packaging techniques and hygienic-sanitary conditions created during processing. Theoretical studies of the impact of bacterial load on tissue parts accept a reduced load in the area skin. The interior offers significant changes in the thigh area, in white meat and near organs.

3. The area near the organs is very great load especially concentrated area around digestive apparatus. Greater load is bacterial load. Identify visible colonies developed large and often microbial forms living together and jointly use the terrain where developed. Among the yeasts identified inside dominate them with pseudomyceliums, while the number of the other is almost completely reduced.

4. The neck area is very busy. This coincides with theoretical material. [1] It is accepted theoretical that slaughter techniques could increase microbiological load.

5. Looking at the changes that provide specific particles also recommended control products traded in pieces, but also those following thermal treatment destination, when it comes to mass consumption (particles used in Fast Food)

6. Despite that product are treated thermal this does not mean that will be tolerated any microbial load. Assessment of minimizing the load begins in the untreated sample.

7. The term safety get the sense that its products launched in the market, and not simply left to thermal treatment forms, but the use of effective methods on untreated samples with reducing agents to microbial load including natural antimicrobial agents. In untreated Patos chickens dominant is bacterial load, it is almost negligible mold load. In untreated Boboshtica chicken dominant is bacterial load and mold load, where both significantly reduced after treatment.

8. There are also cases of impropriety, as some mold load identified after treatment of Patos poultry which are not untreated. It can be casual, connected with the analysis environment that may have had a prior audit or a limited action antimicrobial agent. In this case the detailed controls and suggested a new interpretation of the results only for molds.

5. REFERENCES

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