ABSTRACT

Keywords: *broiler, infections, bacterial microflora*

Bacterial infections are often found in broiler chickens, grown on the ground, because bacteria with pathogenic potential exist both in the organism and in the surrounding environment. Many of these potentially pathogenic microorganisms, expressed in certain favouring conditions, have been isolated from broiler chickens and also from different parts of the environment (water, food, tools), without being involved in morbid actions, clinically and immunologically stated. Otherwise, in favouring conditions, represented by alimentation, growth technology, zoo-hygiene conditions, intervention of external stress factors, maternal line, etc., epiphyte microorganisms, with pathogenetic potential , multiply excessively, penetrate limitary the organic barriers and determine localization in the lymphoid formations, without being accompanied by morbid actions or immunologically activations. These dynamically balanced situations can change, under the action of stressful factors, in infectious cases, sometimes really critical, with septicemic evolution, under the action of stressful factors. This is why, the epiphytism situations or carrier situations woth organic localizations must be considered particular forms of manifestation of the same infectious process, dependant on many factors and witch can generate each other. Moreover, it can be said that the totality of epiphyte microorganisms, regardless the species, have a pathogenic potentiality of which the expression depends on the nature of the relationship that is made between the organism and the germs, on the dose, on the reactive features of the organism and the intervention of stress factors.

Chicken meat, especially the broiler chicken's one, represent a food with numerous qualities, which makes that, in the future, the production will grow constantly. Therefore, the invalid qualities of the meat determines it to be used for the convalescence period of many infectious and non-infectious entities and its biologically high value, like the acceptance of the usage by all nations, regardless the religion, recommends it to be consumed with trust and without any restrictions. Considering the reasons above, growing broiler chickens and, of

course, the meat production, will be spectacular in the future and more rentable in most countries around the globe.

To increase the efficiency of food conversion in poultry, in accordance with present standards, the accent is on maximizing the endurance to diseases of the host, so a healthy intestine represents the biggest contribution for obtaining optimal performance. A good health depends on maintaining a balanced relationship between the large number of microorganisms that colonizes the gastro-intestinal tract, on one side and a complex of monitoring measures of the host-system, which is very sensitive to those organisms and their products, on the other side. A division in this extremely evolved relationship stimulates a protection reply from the host and implies a waterfall of events which determine the occurrence of gastro-intestinal diseases.

The main bacterial species, potentially pathogenic, involved in producing the diseases in meat chickens, grown on the ground, are represented by *Escherichia coli, Clostridium perfringens, Staphylococcus aureus, Streptococcus spp., Salmonella spp.*.

Obtaining and maintaining an optimal balance between Gram positive and Gram negative flora, from the gastro-intestinal avian tract, is of very high importance because, unbalancing the intestinal ecology, known in the E.U. as dysbacteriosis, can have unwanted effects expressed through an excessive multiplication of some, disadvantaging others, transforming from potentially pathogenic in pathogenic bacteria, with the release of aggression and producing inflammations of different intensities. Under these circumstances, the clinical effects and the financial impact of gastro-intestinal diseases can be catastrophic . The intensity of the inflammatory act is influenced on one hand, by the host endurance and on the other hand, by pathogen factors, which stimulate and interact permanently with the immune system of the bird, making it more sensitive or more resistant to the pathogenic action of the causal agent.

Considering these aspects, the research has followed both the prevalence of bacterial infections and implicitly the presence of causal bacterial flora in broiler chickens, grown on the ground, on permanent bedding, and the relieving of the favouring part of some risk factors in the occurrence and evolution of morbid entities.

The paper includes 161 pages are written in X chapters and is divided into two distinct parts. The first part (Chapters I, II, III and IV), developed during a 35 pages, representing 21,73% summarizes the main data from the literature regarding bacterial infections encountered in broilers reared permanent ground litter and is "current state of knowledge" and the second part (chapters V, VI, VII, VIII and IX), spanning 126 pages, representing 78,27%, refers to "own research". Each chapter in Part 2 of the thesis, has included material and method, results obtained with their discussion and partial conclusions.

In **Chapter X**, entitled "**Conclusions and Recommendations**" are summarized in the 28 formulations, key issues drawn from the investigations, and the results were formulated and 9 recommendations, necessary supervision and control of bacterial infections in broilers .
The paper presented 30 tables, 123 figures and the bibliography includes 119 titles.

The first part of the paper is a synthesis of the literature on bacterial infections encountered in broilers reared on litter ground permanently, with particular emphasis on the etiology and risk factors contributory role in the emergence and developments.

In the **first chapter**, titled "**Bibliographic data on bacterial infections in chickens reared for meat ground on permanent litter**" are currently available data on the one hand the presence and mechanism of implicit and evolution of bacterial infections, according to system intensive and, on the other hand the role of risk factors favoring multiplication of bacterial species and the emergence of morbid entities Comes with economic implications.

Chapter II, entitled "**Bibliographic data on infections caused by *Clostridium perfringens* in chickens reared for meat groun**d", treat the entity determined by some serotypes of toxigenic Clostridium perfringens in terms of etiology, epidemiology, clinical, lesion, the prevention and combating.

Chapter III, titled " **Bibliographic data regarding avian coli-bacillary infections** " presents data on spreading the importance, the etiology of pathogenic factors, epidemiological characteristics, pathogenic mechanism and clinical, pathological, diagnostic, prevention and control in infections coli-bacillary influenza.

In **Chapter IV**, entitled "**Bibliographic data on avian staph infections**," summarizes the data presented in the literature with respect to morphology, antigenic structure and pathogenicity elements of the etiologic agent, and epidemiological aspects, clinical, lesion, diagnostic and prevention and control.

Chapter V, entitled "**Purpose and research objectives**"

The main bacterial species involved in producing disease potentially pathogenic for chickens for meat raised ground are represented by *Escherichia coli, Clostridium perfringens, Staphylococcus aureus, Streptococcus spp, Proteus vulgaris, Pseudomonas aeruginosa, Campylobacter spp, Mycoplasma spp and Salmonella spp*. Their presence in the body, is expressed only in intestinal or respiratory epifitism states, exceeding barriers organic gastrointestinal and respiratory respectively. Sometimes the conndiţii favoring represented food, breeding technology, zoohygiene conditions, the intervention of external stress factors, maternal line, etc., Epiphytic organisms with pathogenic potential, multiply excessively limited penetrate barriers is expressed by locating organic without being accompanied by morbid manifestations and immunological activation. These dynamic equilibrium can turn into infectious processes,

sometimes very serious, with fatal septicemia, under the action of stress factors. Therefore, states or states epifitism carriers localized organic actually be seen as a particular form of manifestation of the same infectious process dependent on many factors which can generate one another. Moreover, it can be stated that all epiphytic microorganisms, regardless of species, have a pathogenic potentiality whose expression is dependent on the nature of the relationship between body and what Stabill germs dose of reactive features of the body and the intervention of factors action stressful.

With this in mind we decided to investigate the prevalence of some species of epiphytic bacterial pathogen and thus potentially morbid entities determined, and on the other to identify and analyze the factors important contributory role of excessive multiplication of germs and thus emergence and evolution of bacterial infections of different intensities, meat chickens reared on litter ground permanently.

To this end, research under a broiler rearing complex ground on permanent litter pursued objectives:

Investigations on the prevalence of potentially pathogenic bacterial species and thus infections caused reared broiler litter the ground permanently.

Research on infections caused by *Clostridium perfringens* in broilers reared on litter floor permanently.

Research on colibacilare infection of broiler litter raised ground permanently. Research on the prevalence of staphylococcal infections in broilers reared on litter ground permanently.

Chapter VI, entitled "**Research on bacterinene infection prevalence in broiler flocks reared ground**" Record data points based on consultations and treatments, the analysis report issued by the microbiology laboratory at DSV Galati and my own research that in 2008-2012 there were 107 morbid entities of various intensities, represented by: enterotoxiemii anaerobic colibacillosis, staphylococci, salmonellosis, mycoplasmosis and nonspecific enteritis, home food that the whole production cycle at a 5.631.109 actually resulted in morbidity of 1,04% and mortality of 3.49%.

Depending on the entity, have been isolated and identified, the prevalence different causative agents represented by: *Escherichia coli* (59.00%), *Clostridium perfringens* (13.05%), *Mycoplasma spp* (9.53%), *Pseudomonas aeruginosa* (7.72%), *Staphyolcoccus aureus* (6.00%) and *Campylobacter coli / jejuni* (4.70%). In most of them, are widespread in the environment bacteria that normally colonize the gastrointestinal tract and airways, which were isolated from chickens with clinical manifestations.

Bacteriological examination conducted on samples taken from dead chickens during transport to underweight babies, bran and from healthy chickens without clinical manifestations

aged 0, 7, 14, 18, 21, 28 and 35 days, showed on the one hand, a variety of bacterial flora, consisting of: *Clostridium perfringens, Salmonella Kentuk, Salmonella enteritidis, Staphylococcus aureus, Escherichia coli and Pseudomonas spp,* on the other hand the prevalence of different bacterial species isolated during the production cycle in broilers reared on litter ground permanently. Therefore, the day-old chicks without clinical signs of disease and no pathological changes, before being introduced into the building, *Escherichia coli* was isolated from the heart and the yolk sac absorbable *Pseudomonas aeruginosa*, while the chicken age 7 days was isolated and identified only *Staphylococcus aureus*. The chickens 14 days of age, were isolated and identificaticat *Escherichia coli* (72%), *Pseudomons aeruginosa* (25%) and *Clostridium perfringens* (3.33%) and the 18-day-old chickens was isolated as a percentage different *Escherichia coli* (75%), *Clostridium perfringens* (20%), *Salmonella Kentuk* (3.70%) and *Salmonella enteritidis* (0.92%).

Bacteriological examination conducted in different periods of the production cycle, the samples taken from the existing feeders feed chickens and isolation revealed the presence of all 3 recipes sulphite-reducing bacteria (*Clostridium perfringens and Escherichia coli*) throughout the growing period. Microbiological load of feed was higher at the start of feeders recipe in front of the hall. Thus, the formulation of demarj feed *Clostridium perfringens* and *Escherichia coli* were present in a higher percentage of 75% and 12.50%, while finishing the feed of the formulation, which was 8.33% and 4 16%.

Chapter VII, entitled " **Research on a clostridiosis sequence for meat chicken raised at the ground in permanent bedding** ", shows that illness occurred in a flock of 32,215 broiler metis Ross 308, aged 22 days were significantly increased 0.093 them from the first day to 0.983 after 5 days of development, which is an increase of over 10-fold, with an average of 0.37% and the cumulative mortality of between 2,086 and 5,824%.

It also shows a significant increase in mortality dynamics in the fourth week, when there was a rate of 3.48%, compared with 0.5% mortality accepted.

Clinically, patients were apathetic offspring with drowsiness, inactivity, ruffled feathers, agglutinated in the midline of the sternum to vent and lower body development (less developed). At necropsy, lesions were found at a different frequency represented by the presence of bowel wall hemorrhage (28.37%), necrosis of the intestinal mucosa (23.22%), the presence of gas in the intestinal contents (18.57%), intestinal inflammation (1573%) and the presence of mucus in the intestines orange red (14.10%).

Bacteriological examination conducted by seeding the culture medium enabled anaerobic *Clostridium perfringens* isolation of the etiologic agent of chicken samples creeping 11.66% of chicken carcasses 10,11% 61,53% of the feed and the water of 3.09%. The high isolation of

Clostridium perfringens (61.53%) suggests that the feed taken from the hall was an important source of infection for broilers reared on the ground.

Evolution of clostridioza episode caused significant economic perder due to increased mortality of 6.45% out of the populous (32,253 chickens), by decreasing the weight of 4139 kg meat slaughter and cost of 7 tons of feed consumed more.

Chapter VIII, entitled "**Research on coli-bacillary infection in broilers reared on litter permanent ground**" shows a herd of 29,988 chickens cumulative morbidity and mortality significantly increased after 3 days of age, when there were 675 dead chickens which is about 2.26%. The high morbidity and mortality was recorded for 14 days, when the flock of 29,988 chickens have died in 2046, which is 6.82%. In addition, increased morbidity and mortality was recorded during the first two weeks of age the chickens when they died 4.75% and 1.94%, compared with the proportion of 0.9% to 0.7% allowed by technology.

Coli-bacillary infection in chickens aged 3-12 days, developed clinical acute septicemic (coli-septicemia) expressed by adinamie, anorexia, prostration, lacrimation, conjunctivitis and high mortaliate and those aged 35 - 45 days developed chronic. with adinamie, pale crest and the presence of scabs on the skin (cellulite coli-bacillary).

At necropsy revealed changes were based on the shape of evolution (acute or chronic), expressed enteritis lesions, liver embryonic umbilical ring hypertrophied, vitelosaculită, omphal, ascites, yolk peritonitis, pericarditis, yolk sac and omfalofeblită with nonabsorbable yolk peritonitis, or the forms of fibrinous pericarditis, perihepatitis fibrinous airsaculitis and poliserositis, and in the chronic subcutaneous connective tissue infiltration and the presence of yellow brown crusts.

Sowings made on the usual media (nutrient broth and agar) and on special media from bone marrow, heart and brain allowed the isolation of the etiologic agent, *Escherichia coli*, identified based on morphological characters, cultural, biochemical pathogenicity. The presence of the etiologic agent in bone marrow and brain, older broiler for a few days, we suggest that the source of infection is the breeding farm where the germ was transmitted vertically through the egg and strain is highly pathogenic (APEC-Avian pathogenic *Escherichia coli*) as evidenced by biochemical tests positive fixing Rosh Congo (Congo Red binding - CRB), considered a marker of virulence of APEC strains and the molecular biology multiplex PCR method that allowed detection of genes (ISS, ompA, and FimH), both for the reference strain and the strain isolated from the farm.

APEC strain of *Escherichia coli* isolated proved sensitive to ciprofloxacin fosbac and moderately sensitive to neomycin, colistin and enrofloxacin and resistant to doxycycline, ampicillin and amoxicillin.

Chapter IX, entitled "**Research on the prevalence of staphylococcal infections in broilers reared on litter permanent ground**", the results of the epidemiologic, clinical, laboratory and necropsy performed on a herd of 450,000 of 12 halls populated with chicks, over a period of 16 days.

Epidemiological investigation revealed that *Staphylococcus spp* infections, occur most frequently during the two periods of age: - between 0-2 weeks - with evidence of Omphalos and femoral head necrosis in 4 - 6 weeks - with manifestations joints.

Clinical staph infection developed chronic joint and skin localizations expressed by lameness, poor movement, and some copies were refusing to move to watering and feeding lines, accompanied by some general signs.

Necropsy performed on broiler carcasses of different ages (1, 14 and 25 days), and we showed Omphal yolk sac resorption, arthritis, synovitis and gelatinous infiltration of the subcutaneous connective tissue in the joints swollen, the presence of subcutaneous hemorrhage, and necrosis of femoral head fracture skin.

Plating usual culture media (agar and nutrient bulion) and selective media (Chapman and Bayrd-Parker) of calves in, brain, bone, intestine and joints, taken from embryonated eggs, broiler day-old, 14 days and 25 days led to the isolation of 92 strains of *Staphylococcus*, which caused hemolysis of rabbit blood (86.95%) were coagulated rabbit plasma citrate (80.43%) and fermented in rural manita Chapman (82.39%). Percentage of strains with increased hemolytic activity, citrated plasma coagulation and fermentation of mannitol indicates that *Staphylococcus aureus* strains isolated from pathological processes are pathogenic.

In **Chapter X**, entitled "**Conclusions and Recommendations**" are summarized in the 28 final conclusions, key issues drawn from the investigations, and the results were formulated and 9 recommendations, necessary supervision and control of bacterial infections in broilers.

The **bibliography** includes a number 119 titles in the literature at home and abroad, with reference to bacterial infections of broilers reared on litter ground permanently.