ABSTRACT

The researches have been carried out within the S.C. "INTERAGROALIMENT" S.R.L., Şerban Farm, situated in Zorleni Place, Vaslui county, starting from a flock of 134050 day old chicken broilers, which belonged to the "Ross-308" commercial hybrid.

Knowing that certain studied parameters could not be assessed on this high amount of fowl, certain control groups have been established, counting thus 200 chickens/every experimental group. All chickens in control groups have been individualised. Those marked chickens that were lost during experiments were replaced with other individuals from the hall, which presented live weight values closer to the group average.

Experimental series I comprised two experimental groups, a control group (Lc1) with a flock of 7900 chickens and another group (L1exp.), which included 7950 broilers; feeding of Lc1 group was done using complete mixed feed, supplemented with feed additives ("BIOSAF" – 0.08%, during growing period; "AVATEC" (lasalocid) – 0.06%, during starter and grower periods; "BIOPLUS 2B" – 0.01%, during starter period; "KEMZYME MS dry" and "MYCOSORB", in 0.05% inclusion rates, across the three technological periods) and fish meal, 2%, during starter period; feeding of L1exp. group chickens was done using mixed feed, which comprised a natural coccidiostatic – "EIMERICOX", included at 1 kg/tone and fishmeal, 2%, during starter period.

Experimental series II included four experimental groups: a control group (Lc2), with a flock of 12150 chickens (15 chickens/m^2) and three experimental groups (L2exp.÷L4exp.), which counted: L2exp. – 12150 chickens (15 chickens/m^2); L3exp. – 12960 chickens (15 chickens/m^2) and L4exp. – 11340 chickens (15 chickens/m^2); the complete mixed feeds used in Lc2 broilers feeding comprised certain feed additives ("AVATEC" (lasalocid) – 0.1%, during starter and grower periods; "BIOPLUS 2B" – 0.1%, during starter and grower periods; "KEMZYME MS dry", 0.05%, during all three technological periods and "MYCOSORB", in doses of 0.10%, during all technological stages), while the feeds given to the experimental groups chickens (L2exp. ÷ L4exp.) were not supplemented with additives.

Experimental series III comprised four groups as follows: a control group (Lc3), with a flock of 18000 chickens (15 chickens/m^2) and three experimental groups: L5exp. – 16800 chickens (14 capitis/m^2), L6exp. – 18000 chickens (15 broilers/m^2) and L7exp. – 16800 chickens (14 broilers/m^2); the mixed feed given to Lc3 fowl contained both feed additives ("BIOSAF" – 0.08%, during growing; "AVATEC" (lasalocid) – 0.06%, during starter and growing; "BIOPLUS 2B" – 0.1%, during starter; "KEMZYME MS dry" and "MYCOSORB", in doses of

0.05%, in all three technological periods) and fish meal 2%, during starter period; chickens from L5exp group did not received feed additives while fish meal was included at 2% from starter feed recipe. Other experimental groups (L6exp. and L7exp.) received mixed feed without additives and fish meal.

Chickens were reared on permanent litter, till they reached 42 days old and were slaughtered. A group of 100 chickens were analysed to assess slaughtering performances, which meant 50 individuals (25♂ and 25♀) for each group. Poultry houses were endorsed with Big Dutchmann equipments. The researches subjected in this paper, concerning the usage or the non-usage of certain feed additives or fish meal in chicken broilers, or the usage of some different brooding densities, allowed us to raise some conclusion and to give some advices, as it follows.

Microclimate in poultry houses

1. Within the *experimental series I*, the microclimate factors in both halls that hosted studied chicken broilers, did not significantly vary between halls. Thus, the *temperature provided to the chickens* **was slightly higher than that recommended by** "Ross Breeders" company, for the "Ross-308" hybrid. This situation mainly dew to the external higher temperatures during the 12.07 – 30.08.2005 period, the halls being not acclimatised. The *relative air moisture* from halls varied within narrow limits, around the standard values recommended for the used hybrid.

2. The microclimate factors did not also significantly vary during the *experimental series II* among the halls Thus, the *temperature* provided was little bit higher than the "Ross Breeders" company recommendations for the "Ross-308" hybrid. The *relative air moisture* from halls varied within narrow limits, around the standards.

3. The microclimate factors studied during the *experimental series III* did not recorded significant variations between halls. Thus, *the environment temperatures* were slightly lower than the "Ross Breeding" company for the studied hybrid, dew to the lower external temperatures. Related to *relative air moisture* we could state that in all experimental groups the values were close to normal. The same situation occurred with the ventilation rate, which was found within the range specified by "Ross-308" technological manual, in all four studied halls.

Weight gain dynamics

1. In weight gain dynamics assessment, from the *experimental series I* it was found that the values achieved by both experimental groups were lower than standard weights. The differences between standard and studied chickens occurred from the very first day, the standard value being 6.07% higher than those occurred in control group Lc1, respectively 5.71% higher than those from the experimental group (L1exp.). The differences became more relevant as fowl turned old, thus, at 42 days old, the standard value was 22.73% higher than the average chickens weight in control group Lc1, respectively 18.29% higher than that in experimental group L1exp. Between

2 (two) experimental groups, certain statistical differences, distinguished significant were found at slaughter (42 days), the average weight being 1857.45÷ 15.55g in Lc1 group and 1960.85±15.89g in L1exp group. The average daily gain was correlated to chickens growing speed.

2. In *experimental series II* the acquired data indicated values higher than hybrid standard, which meant 1.33-1.44% more at chickens aged 7 days for L3exp. and L4exp. groups; 1.17-6.46% more at 21 days; 3.50% more at 28 days and 4.82-7.16% more at 35 days, in all experimental groups. At slaughtering age (42 days), body weights were under the standard - 2400g; just two groups approached standard performances - Lc2 and L4exp. (2370.80g in Lc2 and 2357.34g in L4exp. It resulted that chickens feeding with mixed feed without additives (L2exp, L3exp and L4exp groups) did not beneficially the body weight of the studied broilers. The experimental groups obtained 0.56-10.3% lower performances. Poorest result was found in L3exp group, which presented the highest brooding density – 16 broilers/m^2. The average daily gain (ADG) was correlated to the growing speed and was cu 0.56-10.47% lower in experimental groups, (L2exp., L3exp. and L4exp.) compared to the control one (Lc2).

3. During the *experimental series III,* it was found that those chickens fed without additives but with fish meal and brooded at 14 capitis/m^2 density (L5exp.) achieved average body weights higher with 0.85-3.68% than the other fowl. Poorest results issued from L6exp. group, whose chickens were fed with conventional mixed feed (no additives, no fishmeal) Average of body weight at 42 days was 2.65-3.82% lower in L6exp., compared to other groups. The average daily gain values were also correlated to growing speed. Thus, at experiment finishing (42 days), the cumulated weight gain was 0.92% higher in L5exp. group, compared to Lc3 group, while the L6exp.÷L7exp. groups performances were 0.24-2.89% lower than control-Lc3.

The results issued from all three experimental series (I, II and III), related to chickens weight gain, suggested that the performances from series I (weight gain was good in additive less group) were not confirmed during series II. In experimental series III, the L5exp. group (no feed additives, fish meal supplementation) gave better results than other groups. The L6exp. and L7exp. (no additive supplementation), were situated at lower performances, compared to groups.

Lower density provided to L7exp. chickens (14 chicks/m^2) induced higher live body weight at slaughter age (42 days), more than that achieved in L6exp. group, which meant a density of 15 chcikens/m^2 and closer to that obtained in the control group – Lc3, which received feed additives and identical density at onset.

Feed consumption

1. Cumulated feed intake (g/chicken) during the *experimental series I* was 5.32% higher in L1exp. group, compared to control group (Lc1), straight correlated to body weight dynamics; the

feed conversion ratio (kg feed/kg gain) was 0.48% lower in this group, compared to the control one (Lc1).

2. During the *experimental series II*, the cumulated feed consumption (g/chicken) was 2.83-8.98% higher in L4exp., compared to the other groups – Lc2, L2exp., L3exp. The feed conversion ratio (kg feed/kg gain) values revealed 3,59-4,69% better performances in experimental groups (L2exp., L3exp. and L4exp.) compared to control group (Lc2), indicating thus poorer feed conversion in those chickens that received mixed feed without additive supplementation.

3. The cumulated feed intake of the chickens from the *experimental series III* (g/chickens) recorded at experimental groups L5exp. and L6exp. was 0.87-1.52% higher than that achieved by Lc3 group, while in L7exp. group, the intake was 0.67% lower than the reference group. Feed conversion ratio index revealed that in Lc3 group was 1.79 (kg feed/kg gain), while in the experimental groups, it varied between 1.80 – 1.83, with 0.55-2.23% higher than control group (Lc3). Therefore, feed additives usage generated feed valorisation improvement. Lower brooding density also reduced feed competition, then generated better conversion.

Blood parameters

Main studied blood parameters, respectively the hematocrit, haemoglobin quantity and erythrocytes amount were found within normal limits, as specified in the examined speciality literature. The values found for the three parameters were close between all experimental groups, no statistical significant differences occurring among them.

Flock casualties and their reasons

1. Whole flock casualties during the *experimental series I* represented 6.15% in control group Lc1 and 6.10% L1exp. experimental group. Most casualties occurred during the first week of life, being of accidentally kind. Other reasons for casualties were represented by enteritis and coccidioses. No specific illness was observed during the remaining period.

2. In *experimental series II*, total casualties represented 3.31% in control group Lc2; 3.14% in L2exp. group; 3.29% in L3exp. group and 3.22% in L4exp group. Most casualties also occurred during the 1st week of chickens life, being produced by accidents.

3. No specific problems issued in the *experimental series III*. Total casualties reached 3.52%, being considered within normal limits. Most significant casualties also were observed during the 1st week of broilers life.

European efficiency factor (EEF) and economical efficiency

1. The values calculated for the EEF, in both groups from the *experimental series I*, were situated over the limit of 200 (222.61 in control group Lc1 and 236.60 in experimental group L1exp.). In L1exp. group, the value was 6.28% higher than in Lc1 control group. Production

expenses in the control group (Lc1) were lower than those observed in the experimental one (L1exp.), which meant 4.27% less, due to highest feed intake level in L1exp., respectively + 5.05% than the intake recorded in Lc1 group. The revenue obtained by the control group (Lc1) was 1646.48 €, meaning 5.59% less than that achieved by the experimental group (L1exp.) – 1738.61€.

2. The European efficiency factor established for those four groups (Lc2, L2exp., L3exp. and L4exp.), which formed *the experimental series II*, was situated over the 200 margin (301.63 in control group Lc2; 271.49 in L2exp. group; 258.35 in L3exp. group and 289.84 in L4exp. group). In the Lc2 group, which presented the better body development and lowest feed conversion index, the value vas 3.90-14.34% higher than those EEF results calculated in the experimental groups. Economically speaking, the four experimental groups generated revenue, comprised between 4161.34 Euro (€) in L4exp. and 5546.57 € in Lc2. Expressed in percents, the achieved revenue was 17.50-24.97% higher in control group than in the experimental treatments.

3. Analysing the calculated values for the European efficiency factor (EEF) in the *experimental series III,* it was found that in all groups good values have been reached, the 300 edge being overrun. Best result was found in L5exp group, which meant 0.32-4.38% higher than the other experimental group, mainly due to high body weight of chickens at slaughter moment. Overall, the four experimental groups generated revenue, which was comprised between 5411.94 € in L6exp and 6250.06 € in L5exp. If the revenue generated by the whole experimental group is spread to each brooded chicken (18000 chickens/group in Lc3 and L6exp, respectively 16800 chickens/group in L5exp and L7exp) we could find that for every introduced chicken, certain revenue value were achieved: 0.32 Lei/chicken or 0.08 €/chicken – in Lc3 group; 0.37 Lei/chicken or 0.1 €/chicken – in L5exp. group; 0.3 Lei/chicken or 0.08 €/chicken – in L6exp. group, respectively 0.34 Lei/chicken or 0.09 €/chicken – in L7exp group.

Consequently, it could be stated that feed additives could not be easily removed form chicken broiler feeding, because they effectively contributed in improving feed conversion ratio and chickens health status. Increase of chickens amount/m^2 at brooding moment, from 14 chickens/m^2 till 16 pui/m^2 did not give beneficial effect on their development and feed intake, all productive features being poorer in the later situation.

Considering the achieved controversial results, we consider that feed additive usage (enzymes, probiotics, prebiotics, acidifiers etc.) is absolutely necessary during the actual status quo in chicken broilers husbandry, because they positively affect feed intake, health status and live weight. Meantime, we recommend to use a brooding density of 14 day old chickens /m^2 in rearing halls, knowing that this density value allows to achieve high productive responses.