ABSTRACT

Key words: hens, Kabir, growing, performances, meat quality

Poultry meat is from a very long time into consumers' preferences, but, in the last period, their attention started to be focused on products with a higher sensorial and culinary quality, respectively for meat obtained in smaller farms, where birds have access to exterior of shelters, and their growing is much slower.

To satisfy the customers demands, farmers started to achieve poultry breeds which could offer a prolonged growing, had implemented technologies which can assure a slow growing and use mixed fodders which contain over 70% cereals.

Among the breeds which came in the attention of farmers is also Kabir, hens which have a very pleasant aspect, a very good egg production, a high slaughtering yield and a meat of a very good quality; exploitation of Kabir hens in intensive system have good development perspectives, including in Romania, as the higher consumers' demand for meat and eggs gathered from this breed.

From the above mentioned reasons, we focused on study of productive performances, as well as meat quantitative and qualitative production at Kabir hens breed, to make it available to those who want it information scientifically verified regarding the potential of this breed and especially on meat quality attributes.

The research which was at the base of the current PhD thesis was divided into two experiences, in according with the general organizational design.

In experience no. 1 were evaluated the productive performances, as well as meat quantitative and qualitative production at Kabir hens breed subjected to slow growing, and in experience no. 2 were tracked the same indicators but those ones were referring to Kabir hens breed subjected to fast growing.

The difference between those two growing systems (slow and respectively, fast) was assured by lighting schedules (duration of light and luminous intensity) and by quality conditions of mixed fodder which were distributed to birds.

So, in experience no. 1 (Kabir hens with slow growing) it has gone from a programme with 23 hours of light + 1 hour of darkness, and after that being accorded 8 cycles of 2 hours light and 1 hour darkness (in period 8-14 days), followed by a schedule with 8 cycles of 1 hour light and 2 hours darkness; luminous intensity being of 40 lux in the first 7 days, and after that being gradually decreasing till 5 lux in the last week.

Starter fodder (1-14 days) had 20.04% CP and 2550 kcal ME/kg n.c., the growing one (15-35 days) 18.0% CP and 2320 kcal ME/kg n.c, and finishing fodder (36-50 days) had 15.0% CP and 2295 kcal ME/kg n.c..

In experience no. 2 (Kabir hens with fast growing) were assured 24 hours of light in the first 7 days, then 20 hours light + 4 ore darkness (period 8-28 days), and after that the programme was with 16 hours of light + 8 hours darkness (period 29-50 days); luminous intensity being 50 lux in the first 14 days of chickens' life, 40 lux in period 15-28 days and 10 lux in the last week.

For chickens from this experience were utilised the same types of mixed fodders, but those ones had different quality conditions; so, starter type fodder contained 25.1% CP and 2760 kcal ME/kg n.c., the growing one had 19.6% CP and 2690 kcal ME/kg n.c. and finishing fodder had 17.7% CP and 2750 kcal ME/kg n.c.

The studied biological material into those two experiences was represented by Kabir hens breed, achieved at the age of one day in sexed state, having 50 individuals (25 males and 25 females) in each experience.

Rearing of chickens from those two experiences was realised after a similar technology (with the exception of those two experimental variables), in the conditions assured by Bio-base of Faculty of Animal Science from Iaşi.

For achieving the purposed aim, were recorded/determined and analysed microclimate factors assured to chickens, productive indicators, meat quantitative production, as well as quality of obtained meat.

From the data regarding microclimate regime resulted that assured levels were close for those two experiences and especially that both of them were in the comfort zone specific for chickens reared for meat production.

So, mean assured temperatures in the first week were of 30.52±0.26°C for chickens from experience no. 1 (slow growing) and by 30.644±0.28°C at the ones from experience no. 2 (fast growing), and after that we gradually reduce the temperature till the levels of 18.98±0.09°C (experience no. 1) and 19.91±0.11°C (experience no. 2) as it was assured in the last life week of chickens.

Air's relative moisture in accommodation spaces was of 64.44-68.18% in case of chickens from experience no. 1 and 64.64-69.21% at the ones from experience no. 2, while air flow velocity was assured at levels of 0.056-0.178 m/sec (experience no. 1) and respectively, of 0.055-0.210 m/sec (experience no. 2).

The little bit higher levels of those three microclimate factors recorded at experience no. 2 (fast growing) were due to superior to corporal weight of chickens fact which generate a surplus of biological warm, as well as moisture (from breathing and from dejections), fact which imposed a higher rate of ventilation.

At the end of those 50 days of growing, mean corporal mass of birds which were subjected to fast growing was 1743.75 g, face to only 1498.0 g as was weighted the birds at which were applied the principles of slow growing.

On sexes, males and respectively, females from experience no. 2 had weights higher with 14.48% and respectively, with 13.63%, than the individuals from experience no. 1.

This state of fact was correlated with daily mean gain of 34.08 g/head/day as it was realised by Kabir hens subjected to fast growing (37.04 g/head/day at males and 31.13 g/head/day at females), face to only 28.18 g/head/day as it was at the ones with slow growing (31.56 g/head/day at males and 26.80 g/head/day at females).

During studied period (1-50 days), Kabir hens from experience no. 1 (slow growing) had a total mixed fodders consumption of 3637.86 g/head (3502.86 g/head at females and 3772.86 g/head at males), which represented a daily mean consumption of 72.76 g m.f./head/day (70.06 g m.f./head/day at females and 75.46 g m.f./head/day at males).

In case of Kabir hens from experience no. 2 (slow growing), fodders consumption (total and daily mean) recorded more convenient levels, being lower with 3.57%; on sexes being observed slightly differences, females having consumptions lower with 3.37%, and males with 3.75%.

Based on corporal mass and fodder consumptions were calculated feed conversion ratios for studied birds, resulting the values of 2.493 kg m.f./kg gain at the ones from experience no. 1 (slow growing) and of only 2.059 m.f./kg gain at individuals from experience no. 2 (fast growing).

Analysis on sexes of feed conversion ratio revealed that males had better results, this productive indicator being lower with 9.33% in experience no. 1 and respectively, with 10.91% in experience no. 2, than at females.

During growing, chickens received only a complex of vitamins A, D_3, E and a disinfectant (methylene blue), both of them being administrated through drinking water in the first seven days of life. Nevertheless, weren't recorded cases of out of flock, in none of those two experiences, fact which show that were respected all the bio-security measures during growing and, maybe, a better organic resistance of Kabir breed.

Data obtained after slaughtering indicated a mean mass of warm carcasses of 1023.39 g at birds from experience no. 1 (slow growing) and 1238.05 g at the ones from experience no. 2 (fast growing), from which resulted a slaughtering yield of 68.31% in the first case and respectively, 70.99% in the second one.

In both experiences, males recorded higher slaughtering yields than females (68.51% vs. 68.12%, experience nr. 1 and 71.15% vs. 70.82%, experience no. 2).

Results regarding participation rate of anatomical regions into carcasses' composition revealed that, at birds from experience no. 2 (fast growing) were founded greater rates for breast (with 2.62%), for thighs (with 2.74%) and for wings (with 2.17%), while at individuals reared in experience no. 1 (slow growing) was founded a higher rate of drumstick (with 7.51%).

Higher values for participation rate of anatomical parts in composition of carcasses were at individuals from experience no. 2 (fast growing), with the exception of drumstick which was predominant at birds from first experience (slow growing); also from this point of view, must be mentioned that males had superior results for breast, thighs and wings rate and females only for drumstick.

Mass of internal organs was situated in normality zone, the established mean values for Kabir hens of both sexes being of 34.08-35.74 g for liver, 30.57-32.68 g for gizzards and 7.33-9.17 g for hearts. In all analysed situations, mass of internal organs was higher at males especially for individuals from experience no. 2 (fast growing).

Rate of abdominal fat was 2.07-2.40% at Kabir birds of both sexes, a little bit higher at females (2.26-2.67%), than at males (1.88-2.13%).

Sensorial analysis of meat gathered from those three anatomical regions show that, in all situations, samples collected from females received superior scores for tenderness and consistency, while males' meat was better appreciated for succulence and respectively, aroma and savour are. Also we mention that, at both sexes, the obtained meat from individuals subjected to slow growing (experience no. 1) received higher scores that at the ones with fast growing (experience no. 2).

Under the aspect of chemical composition, Kabir hens' meat presented 25.01 g/100 g dry matter, from which 21.0 g/100 g were proteins, 2.84 g/100 g lipids, 0.91 g/100 g mineral substances and 0.27 g/100 g non-nitrogenous extractive substances.

In case of birds subjected to slow growing (experience no. 1), meat had higher levels of DM, proteins and lipids, in comparison with situation from individuals with a fast growing (experience no. 2) which had a higher content in water, minerals and non-nitrogenous extractive substances; in both experiences, meat from females contained much more substance, proteins and lipids in comparison with the males one.

Kabir hens' meat (both sexes) was characterised by an energetic value of 117.61 kcal/100 g and cholesterol content of 0.220 g/100 g; the last one presented lower levels in pectoral musculature (0.163 g/100 g) and higher levels in thighs musculature (0.344 g/100 g). For those two parameters (caloricity and cholesterol), higher levels were identified at females and respectively at birds with slow growing (experience no. 1).

Meat of the birds with slow growing (experience no. 1) contained with 0.95% more fatty acids than the one of hens subjected to fast growing (experience no. 2); must be mentioned also the superior content in monounsaturated fatty acids (higher with 0.77%) and especially in polyunsaturated fatty acids (with 1.36%).

In meat of the breed studied by us, rate between saturated fatty acids and total unsaturated fatty acids (SFA/UFA) was 0.54 and the one between polyunsaturated fatty acids and monounsaturated ones (PUFA/MUFA) was 0.56.

Fatty acids Ω6 were determined into a mean quantity of 20.635 g, and in Ω3 ones were 1.615 g, rate between them being 13.58; we mention that higher values for those two fatty acids were in meat of Kabir hens subjected to slow growing.

Dosage of macro-elements from Kabir hens meat show comparable levels with the ones of other hens breeds (0.176% calcium, 1.003% phosphor, 0.113% magnesium, 0.244% sodium and 1.421% potassium), aspect valuable also for micro-elements (copper=0.64 mg/kg; iron=65,55 mg/kg; manganese=0,60 mg/kg; zinc=60,09 mg/kg).

Thickness of muscular fibres was lower at females (40.52 µ) and higher at males (42.59 µ); in consensus, density of muscular fibres was higher at females (956.47 fibres/mm^2) and lower at males (893.62 fibres/mm^2). For Kabir birds of both sexes, mean diameter of muscular fibres was 41.56 µ, and their mean density was 925.05 fibres/mm^2.

Diameter of 1^{st} order muscular fascicles was at a mean level of 1169.55 µ, due to values of 1155.05 µ at females and 1184.04 µ at males.

From analysis of meat structure at Kabir birds resulted that, mean rate of muscular tissue was 73.95%, difference being represented by conjunctive tissue (26.05%); we mention that rate of muscular tissue was higher at males (74.16%), than at females (73.73%).

The general analysis of the data regarding the growth performance and the quality of the meat in the chicken chickens of the Kabir breed leads to the conclusion that this breed is suitable for the practice of the two growth systems (slow and fast) tested by us, both determining the obtaining of a quality meat. higher.

Based on the above, we make some recommendations for farmers and processors, namely:

- raising Kabir hens for meat production can be an alternative to meat from industrially raised chicken hybrids;
- depending on the market requirements, breeders can opt for one of the two growing technologies (slow or fast), because the possibilities of processing in culinary preparations of the two categories of meat results are different, in the sense that for some categories of dishes has a higher suitability for the meat of slow-growing chickens, and for other categories that provided by fast-growing chickens;
- it is necessary to start more research on the Kabir chicken breed, which should include knowledge of breeding peculiarities, both breeding and production birds, which will allow the establishment with scientific arguments of the future of this breed in the country our.