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COMPARATIVE STUDY ON THE BEHAVIOUR OF TWO GOOSE GENOTYPES SELECTED FOR CRAMMING DURING THE PRECONDITIONING FOR LAYING

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ABSTRACT

In the case of goose liver production the adoption of EU regulations means that new technologies should be developed instead of force feeding. One of the potential alternatives is the pinguefaction due to periodical feeding, which needs the modification of the feeding behaviour of the goose. The first step of the selection for this character is the examination of the behaviour differences between the adaptable genotypes. In this study the behaviour of two goose strains (white and grey) was compared during the preconditioning period. Based on our results, the behaviour of the two genotypes showed significant differences in the appearance frequency of feeding, drinking and preening. However resting and social behaviour also diverged but the differences were not statistically significant.

Key words: geese / ethology / animal behaviour / feeding behaviour / genotype / fattening / liver

PRIMERJAVA OBNAŠANJA DVEH GENOTIPOV GOSI SELEKCIONIRANIH NA POVEČANA JETRA PRED NESNOSTJO

IZVLEČEK

Po novih EU regulativah bi bilo potrebno pri reji gosi za pitanje na povečana jetra namesto prisilnega pitanja razviti nove tehnologije. Ena od možnih alternativ prisilnemu pitanju za pridobitev povečanih jeter je obročno krmljenje, kar pa potrebuje prilagoditev obnašanja gosi pri krmljenju. Prvi korak v smeri selekcije takšnega značaja je proučitev razlik v obnašanju med tistimi genotipi, ki so sposobni prilagajanja. Raziskava temelji na primerjavi obnašanja dveh pasem gosi (bela in siva) v času pred nesnostjo. Med genotipoma so se pokazale značilne razlike v pogostosti zauživanja krme, pitja in čiščenja perja. Tudi čas počitka in socialno obnašanje je bilo različno, vendar pa razlike niso bile statistično značilne.

Ključne besede: gosi / etologija / obnašanje živali / žretje / pitanje / genotip / jetra

INTRODUCTION

Instead of force feeding new method should be developed in the near future to sustain the goose liver production. Using periodic feeding as an alternative way very good results were achieved. However, this method needs a genotype which shows extra liver production whiteout force-feeding but it has the tendency to change the feeding behaviour from the normal feeding to consume high amounts of feed in a short period of time. This phenomenon could be achieved in two ways:

- forcing the goose for an increased consumption with a modified feeding technology
- selecting for a genotype which is disposed to avidity and increased feed consumption.

The combination of the two ways provides the optimal solution. Since the goose usually is kept under extensive conditions it is not as domesticated as the other poultry species. Prior to

selection the genetic parameters of the behaviour traits of the different genotypes should be determined.

MATERIALS AND METHODS

Behaviour of white and grey landes goose was examined. The experiment and the observations were conducted in accordance with recent studies on ducks (Reiter and Bessei, 1995), and with our former experiments (Molnár *et al*., 1998, 1999; Molnár and Bogenfürst, 1999).

Both examined breeding groups containing four animals (age of one year) were introduced into boxes (1.3 × 2.5m) with the sex ratio of 1 male and 3 female. The stocking density was 0.8 m^2 but after the insertion of the nest boxes it decreased to 0.54 m^2.

Experimental stock was brought up within closed, intensive conditions following the common nurturing and feeding technology. Straw was used as litter, the feed was offered from feed boxes and open surface watering trough was applied for drinking. Five hours of lightened period was used during the examination. In the other boxes of the stable landes grey and meat type goose breeding groups were introduced.

The behaviour was recorded by digital cameras connected directly to a PC. Once in every week of the preconditioning period 24 hours were recorded in both groups. The presented behavioural patterns are values for five hours of the daily illumination time. During the analysis of the video records the appearing frequency data were recorded in every minute. The examined behaviour forms were feeding drinking, resting, social behaviour, preening and playing. The behaviour forms were standardized according to Czakó (1985):

Feeding behaviour includes the exploration of the food, the recognition, nearing, and consuming. The intensive forward and backward movement of the head divides this form from the behaviour of playing with the food particles.

The drinking behaviour has a typical movement characteristic: dipping the beak into the water, and elevating the head with outstretched neck resulting that the water “rolls down” the oesophagus. This helps to discriminate drinking from the behaviour of bathing and playing with the water.

Resting is a neutral stage of the locomotory system which is perceivable from its special position. Resting is frequently interrupted with preening or playing but the duration and intensity of these forms is lower compared when they emerge independently. Adult goose lie rarely during resting usually they only stay motionless.

Social behaviour is a synthetic definition for all the interactions between the individuals of the same group. In our observations the aggression, the greeting and preening of another animal were listed into this behaviour form.

Preening is behaviour connected to the cleaning and ordering the integument and emerges independently from resting with a high intensity. This form was used only for the pluming itself, in other cases the occasion was identified as social behaviour. The preening was often followed by bathing.

Similarly to the social behaviour playing is also used as a synthetic definition for different behaviours having an important role during the ontogenesis and the development of the locomotory senses, but have no practical aim. Playing means generally the manipulation of the litter, food, water and different equipments. Playing in the intensive systems mainly origin from the fact that the goose are not able to satisfy the pasturing instinct.

Regarding the tapes six behaviour patterns have been observed, in practical terms their presence or absence in a given moment as well as their frequency i.e. how many of the 4 birds showed the given behaviour. The data of each behaviour forms was merged and compared to the

summarized value of all behaviour forms. Statistical analysis was done by χ^2-probe and percentage rates with SPSS for Windows 8.0. The contingency table of statistical analysis was 2×6 table (two genotypes, six behaviour forms).

RESULTS AND DISCUSSION

Our observations have shown that the different goose genotypes show different behaviour patterns. The ratios of the different behaviour forms are shown in Figure 1 and 2.

For being able to produce fattened liver without force feeding goose needs to have an inclination for high consuption and high ratio of resting in order to utilize the consumed energy for pinguefaction

Significant differences were found in the feeding behaviour of the two examined genotypes. The appearing frequency of the feeding of the grey landes goose was 3.63% against the 4.13% value of the white genotype. This difference was significant on the level $P<0.05$.

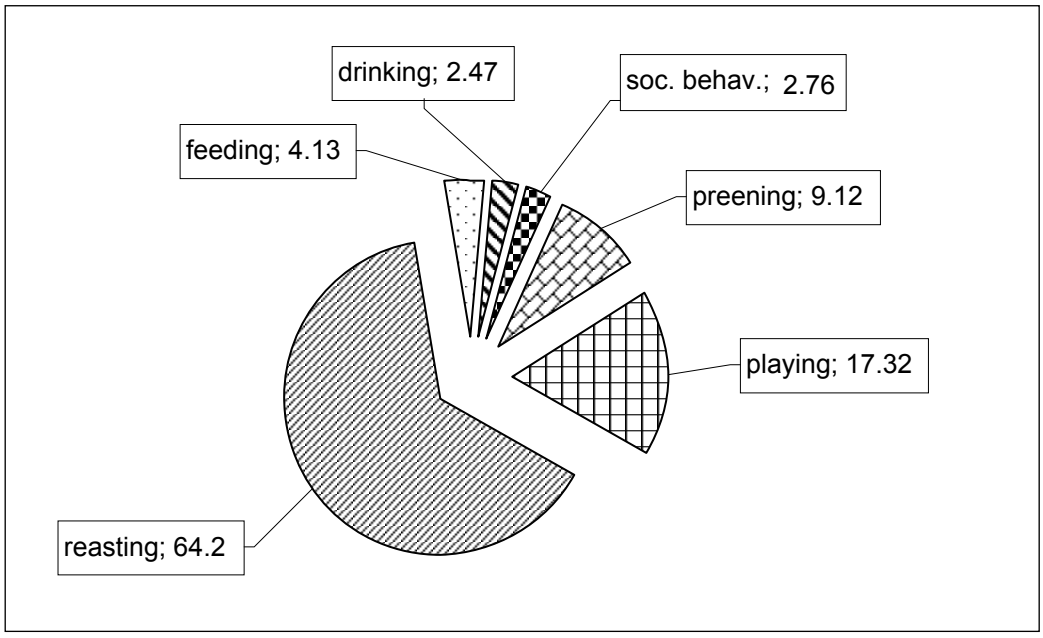

Figure 1. The behavioural pattern of white landes goose, %.

Also the drinking has differed significantly ($P<0.05$). The appearing frequency of the behaviour form was 3.22% by the grey genotype but it was only 2.47% in the white form.

The level of the social behaviour is also very important since the limited time for feeding as environmental stressor may cause increased aggression and decreased consumption.

During the acclimatization the target of this behaviour was mainly the individuals in the neighbouring box. Especially the males have shown increased aggression level but also the other individuals of the group showed hostility towards the neighbours. However the differences between the two genotypes were not statistically significant.

Preening showed statistically significant differences ($P<0.001$). The white genotype expended 50% more time with pluming. While the appearing frequency of the grey genotype was 6.79% the white form achieved 9.12%. It has been suggested that the increased preening activity of the white genotype originates from a lower stress tolerance and indicate a secondary substitutive activity.

Also the stress and the boredom should be responsible for the higher appearance of the playing behaviour (17.88 and 17.32% by the grey and white genotype, respectively). Since the goose naturally is a grassy animal it consumes small amounts of feed at once but spend more time with grassing. Under intensive conditions they consume large amounts of food in a shorter period but they need to manipulate the environment as a gratification of their ethological needs.

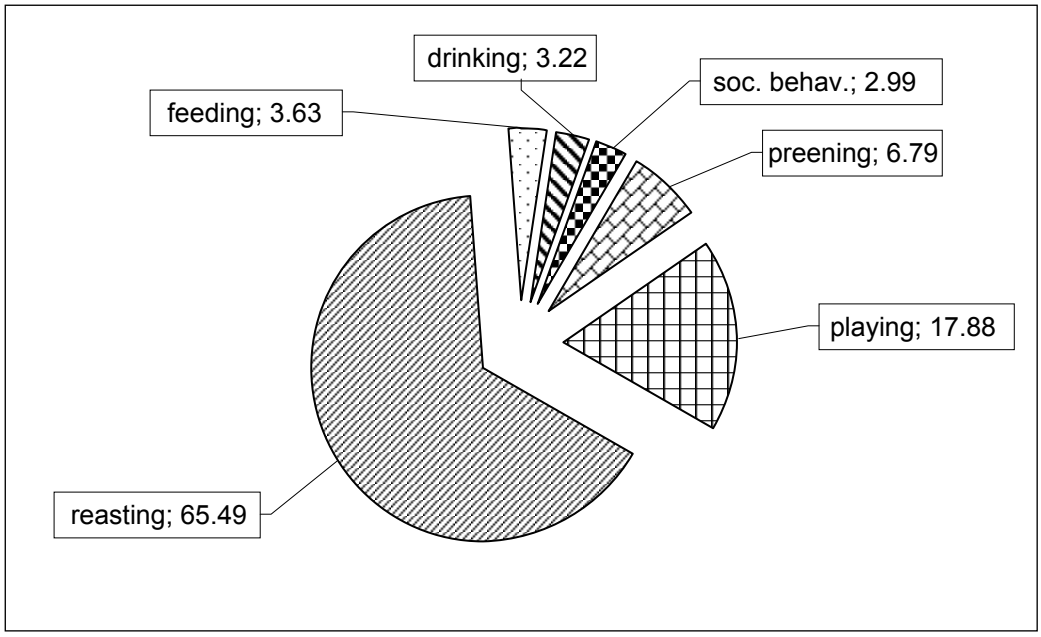

Figure 2. The behavioural pattern of grey landes goose, %.

The behaviour forms mentioned so far could be grouped as active behaviour forms. The resting behaviour contains all the passive behaviour elements. In this study the resting showed significant differences (65.49% and, 64.2% by the grey and the white form, respectively).

CONCLUSIONS

Significant differences were found in the behaviour of the white and grey goose genotypes selected for liver production. Considering the feeding behaviour – one of the important parameters for the liver production without force feeding – it can be stated that under intensive conditions (in the short lightened period before the laying period) the white genotype is preferable because of its higher consumption. However, the resting (the second important parameter) and the social behaviour have similar appearing frequency in both genotypes. Statistically significant differences were found in only the feeding, drinking and preening. The appearance of preening in the white genotype was higher but its cause remained unexplained. The ratio of the active behaviour forms was similar in the two genotypes since the lower frequency of the drinking and social behaviour could compensate the increased preening.

As the continuation of this preliminary study the behaviour is recorded also in the laying period. Moreover, the observations will be carried out during the rearing period of the offspring stock.

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