Relationship between plumage and body condition in non-debeaked laying hens

As result of the EU Council Directive 99/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens, the use of the conventional cage system is prohibited since the 1st of January 2012 in the European Union member countries.

Simultaneously, in some of the member countries (for example: Denmark, Finland, Sweden and Germany) the beak trimming of the laying hens – which is momently allowed till 10 days of age in the European Union – is also prohibited, while in some other member countries (for example: United Kingdom, France and Netherlands) its prohibition is being considered.

TETRA SELECTED FOR QUALITY

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The spread of both alternative and non-cage laying hen housing systems and the more forceful European refuse of beak trimming generate new problems in the commercial egg production. The hybrid layers, which have been reared in cages for more than 70 years, have vital temperament, are susceptible for feather pecking and in more cases they are expressly aggressive. This type of social stress was not considerable in the small group (4-5 hens/cage) housing systems, because its occurrence was efficiently eliminated by the beak treatment with thermocautery, laser or infrared light.

However, it seems that this decades-long selection has resulted in a higher production, but also, – in spite of the purpose of the breeders –, in even greater birds' aggressiveness, which can generate permanent conflicts in large groups raised in alternative systems.

Stopping the beak trimming in laying hens could improve the mortality in the farm in case the current genetic programs remain in use.

Therefore, the present aim of Bábolna TETRA Ltd. is to develop a new hybrid, which is able for high production in alternative housing systems without beak trimming. As first step of this development, non-debeaked layers from 4 lines of the TETRA breeding program were tested in order to compare the changes in their plumage and body condition during the first egg-laying period.

Image 1 - *Fixing of laying hens for the CT measurement*

The hens' body condition (body fat content) was determined by means of computer tomography (CT) *in vivo* at the Institute of Diagnostic Imaging and Radiation Oncology of the Kaposvár University. Before the CT measurements the live weight of the hens was always recorded.

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The experiment was carried out with 1742 non-debeaked TETRA laying hens, raised in EU-compatible furnished cages (1,800 cm² basic area each; 10 hens/cage), in a closed building at the Poultry Test Station of the Kaposvár University, Faculty of Agricultural and Environmental Sciences, in Hungary. Hens were fed *ad libitum* with commercial diet during the whole experimental period. Drinking water was constantly available from self-drinkers.

The plumage and body condition of randomly selected 120 hens (30 hens/line, assigned with wing tags individually) were examined at 20, 46 and 62 weeks of age. The plumage condition in five different body parts was checked: neck, breast, wings, back and tail, taking as a reference the Tauson's *et al.* (2006) photo series. The plumage condition was evaluated for each body part on the basis of a 4-grade scale, where 4 points were given in case of complete plumage and one point was given in case of very incomplete plumage. By summarizing the plumage points for the different body parts, a total plumage point was calculated for each hen. It could be ranged from 5 to 20.

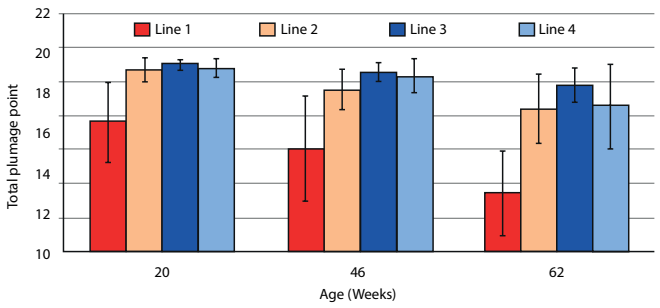

Figure 1 - *Changes in the plumage condition of non-debeaked laying hens of four different lines during the first egg-laying period*

During the CT scanning procedures birds were fixed with belts in a special plexi-glass container, without using any anaesthetics. Three animals were scanned simultaneously (*Image 1*). Due to the special arrangement of the hens, they were separable on the CT images (*Image 2*); therefore, their body fat content was individually determined.