

# SUMMER chickens "on herbs"

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**In the organic RDD project 'SUMMER', an experiment with organic broilers with access to a large range area with herbs has been performed. The effect of chicken genotypes with different growth rates and different feeding strategies on the animals' feed intake, growth, welfare, health and meat quality was investigated.**

**The results so far indicate that it is necessary to use chicken genotypes with lower growth rates for a better welfare, and the focus should be on the individual genotype and its actual nutrient requirements and utilisation of feed from the range area.**



*Broilertype JA757, the only breed used in the Danish organic broiler production today.  
Photo: Janne Hansen*

Organic chickens are expensive which may explain the low market share. The idea behind the project has been to add further quality parameters to the products in order to justify the higher price. More focus on the use of the range areas by the chickens, high animal welfare and the use of locally produced feeds, including feed items from an attractive range area, have been provided.

## Background

According to the current re-

gulations for organic broiler production, it is allowed to have higher daily gain and a significantly younger age at slaughter than was the case after the introduction of organic broiler production in the mid-90s. This often results in leg problems and consequently a lower level of activity among the animals which in turn increases the risk of ulcers and hock burns on the chicken feet. The use of new genotypes with slower growth rates and changed feeding strategies are expected to

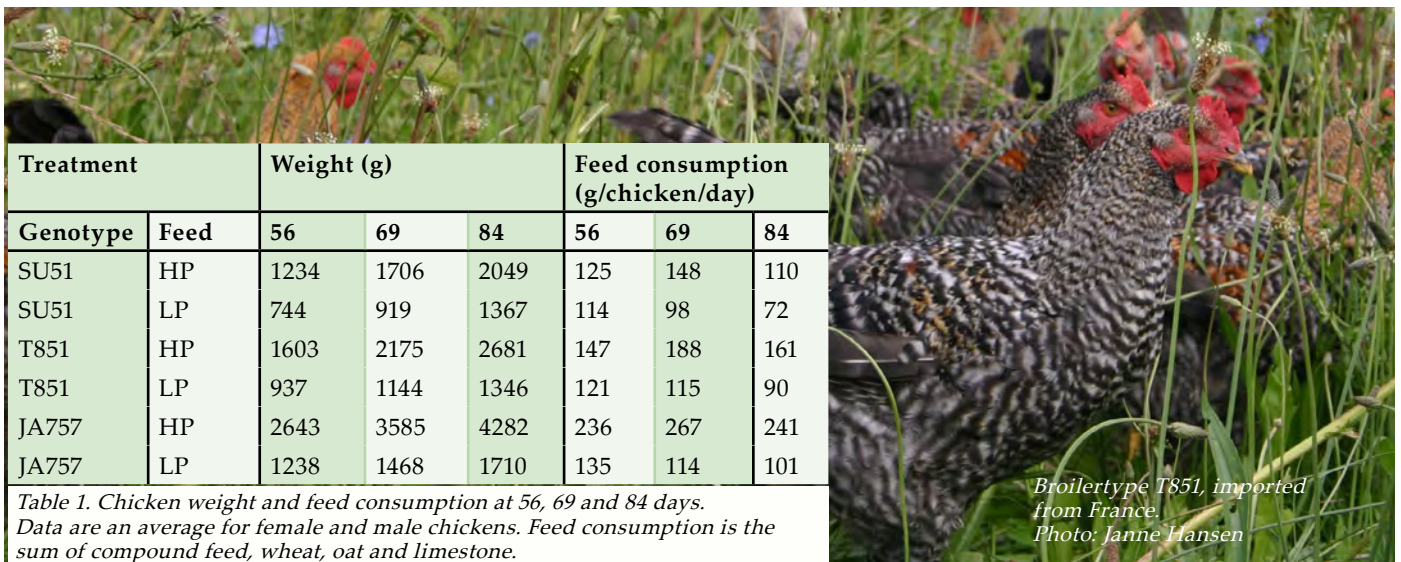
improve the animal welfare and robustness and to increase the intake of feed items from the range area. Additionally, a different meat quality of the broiler product may be expected.

## The experiment

Three broiler types with different growth potentials were included in the study, two of which were imported from France (SU51 and T851), while the third (JA757) is the only breed used in the Danish organic broiler production today.

The chickens were raised

indoor the first 4 weeks of age and were moved outdoor in mid-June 2012, where they were divided into 18 plots of 500 m<sup>2</sup> each. The plots were sown with rye grass and different types of herbs. Forty-two chickens were allocated to each plot / house (app. 12 m<sup>2</sup> per chicken). In addition to the 3 genotypes, 2 feeding strategies were included in the study, one of which (HP) is applied in practice, i.e. organic standard feed and whole wheat (separate silos). In the second feeding



Treatment		Weight (g)			Feed consumption (g/chicken/day)		
Genotype	Feed	56	69	84	56	69	84
SU51	HP	1234	1706	2049	125	148	110
SU51	LP	744	919	1367	114	98	72
T851	HP	1603	2175	2681	147	188	161
T851	LP	937	1144	1346	121	115	90
JA757	HP	2643	3585	4282	236	267	241
JA757	LP	1238	1468	1710	135	114	101

*Table 1. Chicken weight and feed consumption at 56, 69 and 84 days. Data are an average for female and male chickens. Feed consumption is the sum of compound feed, wheat, oat and limestone.*

*Broilertype T851, imported from France.  
Photo: Janne Hansen*



Broilertype SU51, imported from France.  
Photo: Janné Hansen

Herbs etc.	Dry matter	Protein	Methionine	Cysteine
Caraway	16,0	17,7	3,37	1,56
Red clover	16,6	29,6	4,68	2,27
Chicory	11,8	19,2	3,78	1,63
Plantain	11,3	19,5	3,33	1,86
Ryegrass	14,8	21,2	3,99	2,02
Burnet	21,3	18,8	3,42	1,99
Birdsfoot trefoil	17,2	22,2	3,74	2,57
Lucerne	19,9	20,1	3,37	2,49

Table 2. Chemical analyses of herbs from the outdoor area. Protein: g/100 g dry matter, amino acid: g/kg dry matter.

strategy (LP), chickens were offered a feed based on 3 protein crops (peas, rape seeds, lupins) and whole wheat, whole oats and lime stone in separate silos.

#### Chicken weight and feed consumption

A large effect of the treatments on growth was seen. Feeding with HP + whole wheat resulted in growth rates that were very different between the 3 genotypes, reflecting the different growth potentials (Table 1). JA757 obtained the highest, SU51 the lowest and T851 had a growth that was between the other 2. Feeding LP + whole wheat and whole oats, which was based on a 'choice feeding' strategy, resulted in a generally lower feed consumption for all genotypes and thus an overall lower growth. The differences between genotypes were

not nearly as pronounced as with the HP feed strategy.

The proportion of whole wheat in the total feed intake accounted for a much larger percentage in the LP strategy (51-89%) than the HP strategy (8-47%) for all genotypes. Thus, the chickens did not eat very much of the alternative protein feed which may have turned out differently if the chickens had been introduced to this feed already during the first 4 weeks of the rearing period.

#### Protein content of herbs

Chemical analyses of ryegrass and various herbs from the outdoor area are shown in Table 2, and for most species, the content of protein and methionine are high compared with several of the feed ingredients normally used in compound feed. Particularly red clover

had a high content.

Analyses of the content of the chickens' crop also showed that insects, earthworms and snails were part of the feed intake from the range area. Snails had a very high protein (44.8 g/100 g dry weight) and methionine content (6.37 g / kg dry matter).

The analyses show that grasses and herbs on the range area to some extent contribute to the chickens' nutrient supply.

#### Gait score and welfare

Gait score evaluations were performed on 2/3 of the chickens at 55 and 85 days. A gait score rating indicates the chickens' walking ability characteristics, and the lower score the better. Chickens with relatively fast growth are often hampered in their walking ability, and previous studies suggest that a gait score of around 2 are associated with pain for the chicken. In this study, 'JA757' had considerable problems when fed with normal organic feed (HP), while the other two genotypes did not have any problems when fed this feed (Fig. 1). However, 'JA757' had no problems when given the alternative feed (LP) which was associated with a lower feed intake and hence a low growth rate. Evaluation of plumage condition and foot pads revealed the same tendency so that only 'JA757' on HP feed had remarks. In general, the chick-

ens fed with LP feed showed greater foraging activity on the outdoor area.

#### Perspectives

The results so far indicate that chicken genotype and feeding strategy are essential parameters when a high-value chicken production is defined in terms of ethical quality and resource efficiency. Thus, it is necessary to use chicken genotypes with lower growth rate for a better welfare, and the focus should be on the actual nutrient requirement of the breed and the utilisation of feed from the range area. Other factors such as health, meat and eating qualities and the effect of a finisher-feeding strategy are expected to contribute to the overall perspective.

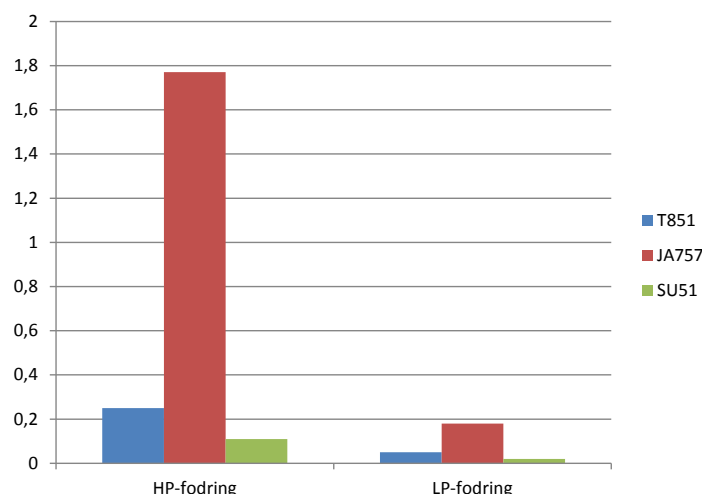


Figure 1. Gait score for the three genotypes for each feeding strategy.

#### More information

Read more about the Organic RDD project SUMMER at: [http://www.icrofs.org/Pages/Research/organic\\_rdd\\_summer.html](http://www.icrofs.org/Pages/Research/organic_rdd_summer.html)



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