Products:
Penergetic-t and AquaKat

User application Report

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Comparative study of laying performance between laying hens in a specially designed cage and in a conventional cage at Premslin egg Farm.

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Keeping laying hens in cages is the most economical and – with regard to consumer protection – best from of egg production. However, there is an urgent need for other methods of keeping hens on grounds of ethical and ethologically-based decisions in agrarian policies.

Of the possible alternatives to keeping hens in cages, the one most suited to a comparative analysis seems to be where specially designed cages are used to house small groups of hens, because in this setting it is likely that:

- the hens can behave more naturally
- the high health status of the flock is maintained
- a comparably high quality product to the eggs from the caged hens can be expected
- production costs, and hence indirect damage to the environment, as well as consumer prices, will increase considerably to the producer and to society.

A comparative study of important parameters in the biological performances, procedural costs and cost effectiveness of both methods of keeping hens on one farm should clarify which differences exist between caged housing and a specially designed cage to house a small group of hens.

The following findings are based on interim results.

The studies began in the specially designed cage when the hens were 46 weeks old (Hall 6), whereas the hens in the conventional cage (Hall 3) were 35 weeks old at this

time. This age difference makes the comparison of performance at a specific point in time somewhat more difficult.

As part of the study, tests were carried out on possible factors affecting on drinking water quality. The aim of these tests, and for the introduction of the 'informed' powder, was to protect the shell quality, which was deteriorating during the laying period.

Various products and systems have been developed to eliminate chemical, physical and information problems in drinking water. One such product is the 'AquaKat'. This product is a physical 'water revitalisation device', which functions in the same way as an indicator (catalyst). During a special manufacturing process, the 'AquaKat' is charged via a gravitational field using implosion technology with the frequency patterns of natural, clean spring water and oxygen (O^2).

The 'AquaKat' passes these frequency patterns on to the water. In this way, any water which passes by the 'AquaKat' is affected on the principle of resonance and it changes its molecular behaviour to develop the properties of typical spring water. This is marked by an altered crystallisation structure (calcification is broken down), a higher capacity to absorb (dissolving properties) as well as an improvement in taste.

The 'AquaKat' is classified as a 'water treatment device'. It is attached to the water mains and does not come into direct contact with the water. A licence from the drinking water authorities is therefore not necessary. The device does not require any maintenance and it does not require any conventional source of energy in order to function.

An 'AquaKat' (supplied by the company D.Plocher) was installed by 'Nature Promotion BORK' to cater for a flow of at least 3 m³/24 hours. Unfortunately, the Kat could only be used over a limited space of time, so the results are unclear.

Similar to the 'AquaKat', the 'informed' powders, which consist mainly of calcium carbonate, are designed to have a positive effect on the well-being of animals and thus on their performance. In order to test this, a product known on the German market as 'Penergetic-t' as well as a Swiss product 'Penergetic for Laying Hens' (which has been designed to meet the special requirements of laying hens) were introduced over specified periods in the animals' feed at a rate of 20 – 50 g per ton of feed given. The results can only point towards certain tendencies; clear effects resulting from these powders could not be proven, probably due to various other undefined influencing factors.

Graph 1 shows flock development for both systems. The curves show clearly that the drop in flock numbers is more pronounced in the specially designed cage (SDC) than in the conventional cage (CC).

A clear effect on flock development as a result of the introduction of the 'AquaKat', which was installed from the 12.12.02 to the 12.02.03 with the aim of improving water quality, later in conjunction with 'Penergetic-t', is not evident.

Even egg production as illustrated in Graph 2 shows that the SDC performs lower than the CC. The number of cracked eggs as well as the number of dirty eggs increases more notably than in the CC. The ratio of laying rates as shown in Graph1 is also better in the CC. However, the fewer fluctuations in laying rates in the CC from the middle of February could be an indication that the AquaKat and Penergetic-t probably had a stabilising effect on egg production.

The proportions of dirty and cracked eggs to total eggs as shown in Graph 4 also clearly point against the SDC. To emphasize this, we can observe the favourable curve in the number of cracked eggs in the CC from the beginning of May, perhaps as a result of introducing 'Penergetic for Laying Hens'. Trial application of this product over a specified period of time was expected to improve shell quality.

Graph 5 shows that the number of cracked eggs does not depend on the thickness of the eggshell. Shell thickness in the SDC increased significantly. Nonetheless, the number of cracked eggs increased dramatically.

A correlation of just r = 0.29 exists between egg mass and shell thickness (see Graph 6). As a result, only 8% of shell thickness variance can be attributed to egg mass variance.

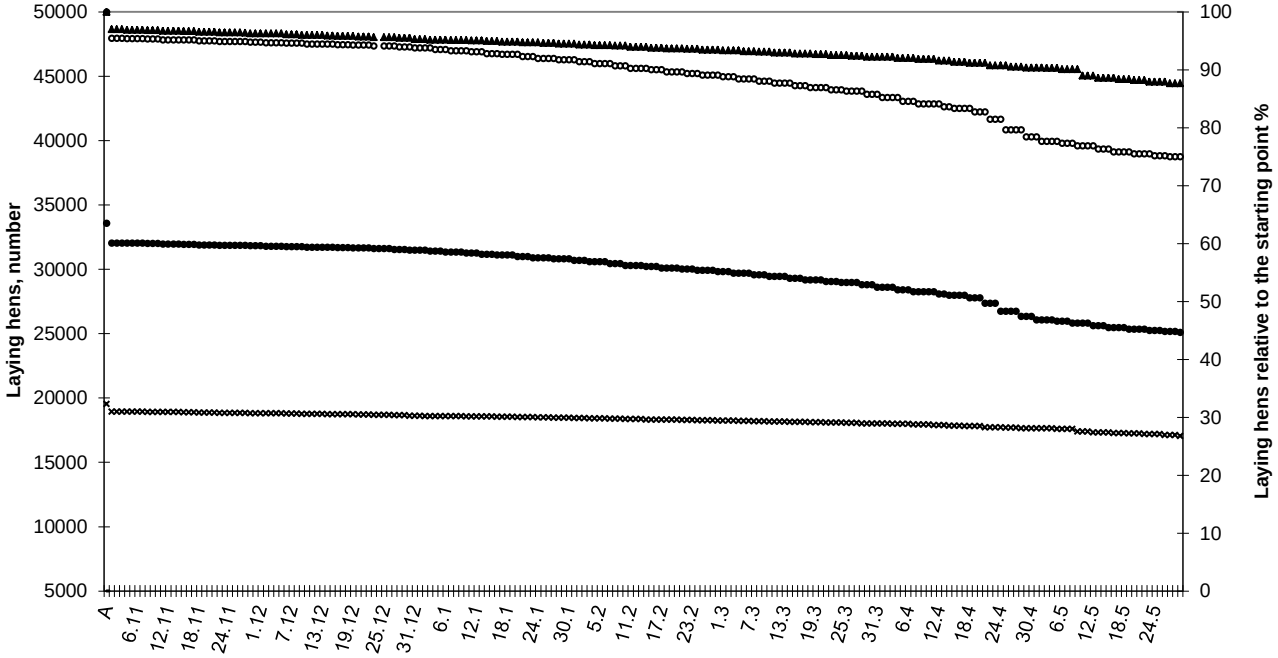
The measurement on 05.06.03 of a significantly lower shell thickness in the CC, as had been expected, obviously did not severely affect shell strength. In fact, quite the opposite was true: according to the visual impression of the operation manager, shell quality had significantly improved. The reason for this may have been the introduction of 'Penergetic for Laying Hens' between 25.03.03 and 05.05.03.

Result

- The actual aim of increasing shell stability through the introduction of the 'AquaKat' was not achieved – however a positive effect on shell thickness could be noted.
- It appears as though germ content in drinking water was reduced. The
- 'AquaKat' probably needs, however, to be in place over a longer period of time.
- The Kat appears to have a favourable effect on the Cu – Zn ratio.
- It is not possible to note a conclusive finding on the Kat performance with laying hens.
- The possibility of designing a specially modified 'AquaKat' for egg production should be discussed.
- The product 'Penergetic for Laying Hens', significantly designed for egg production, tends to improve eggshell quality.
- The effects of 'informed' powders as an animal feed supplement should be investigated further under defined conditions.

- Production performances in the conventional cage are significantly better than in the

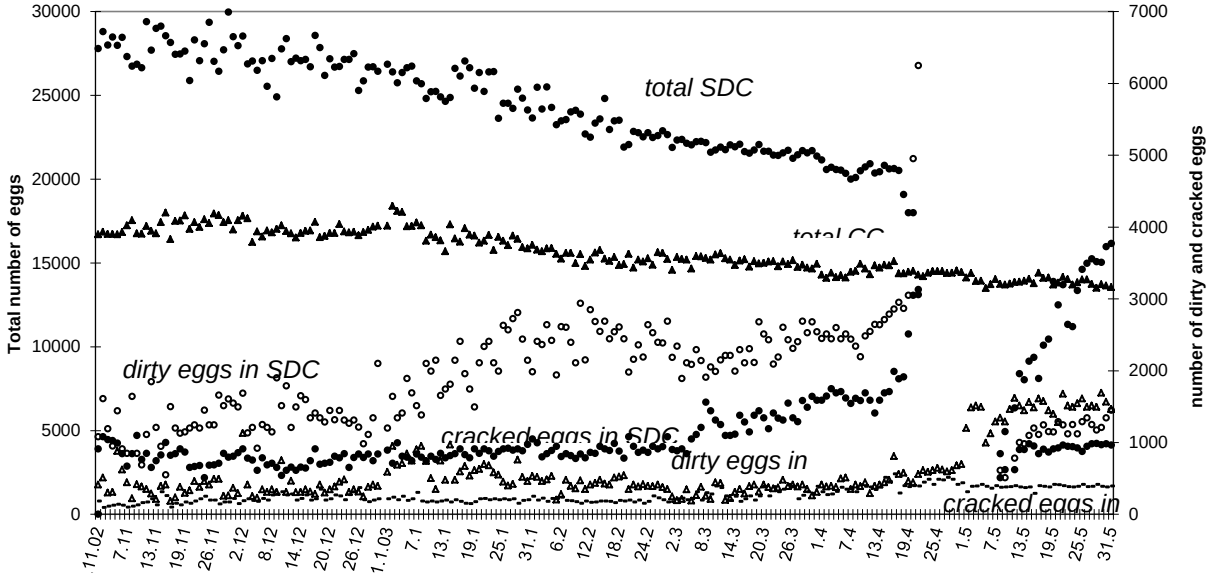
Graph 1: Flock developement of laying hens absolute and relative to starting point
Comparison of specially designed cage (SDC) starting in the 46. week of life **and conventional cage (CC)** starting in the 35. week of life



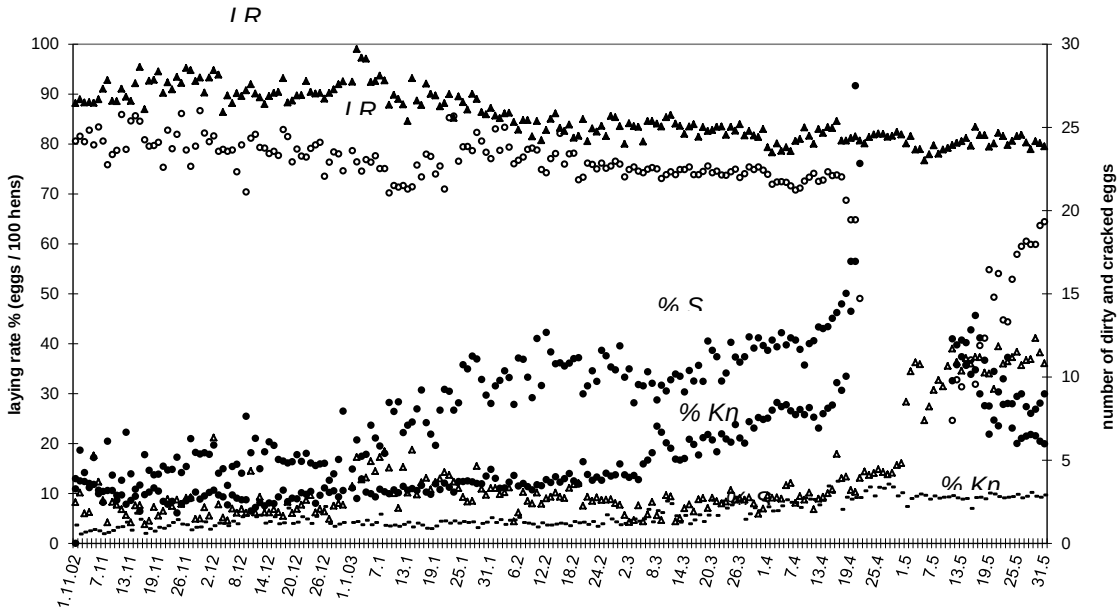
specially designed cage (Meller system).

SDC: from 12.12. 02 Aquakat, from 9.1.03 - 12.02 Aquakat + Penergetic-t **CC:** from 25.03.03 - 05.05. Penergetic-t poultry

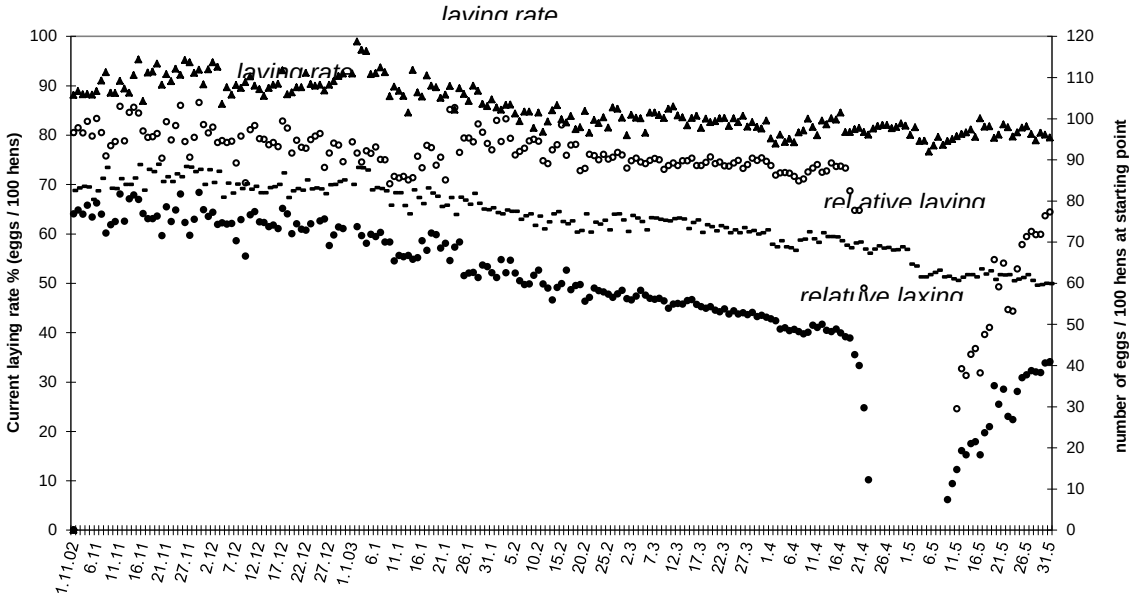
Graph 2: Total number of eggs as well as dirty eggs (S) and cracked eggs (Kn) ,Premslin egg farm
Comparison of specially designed cage (SDC) starting in the 46. week of life **and conventional cage (CC)** starting in the 35. week of life



Graph 4: Laying rate (LR) as well as number of dirty eggs (S) and cracked eggs (Kn) , Premslin
Comparison of specially designed cage (SDC) starting in the 46. week of life
and conventional cage (CC) starting 35. week of life

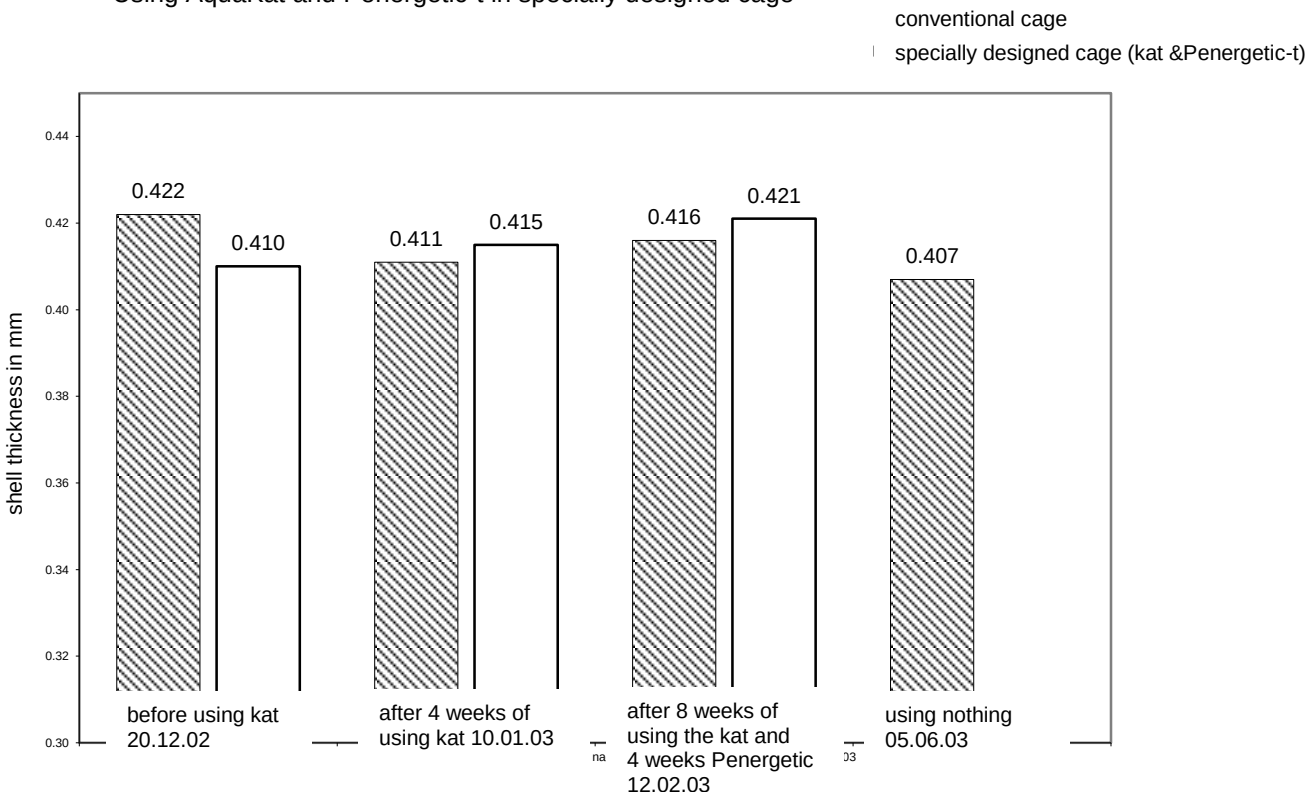


Graph 3: Present laying rate (LR) as well as laying rate relative to starting point, Premslin egg farm
Comparison of specially designed cage (SDC) starting in the 46. week of life **and conventional cage (CC)**
starting in the 35. week of life



Graph 5: Development of shell stickness

Using AquaKat and Penergetic-t in specially designed cage



Graph 6 : Links between egg mass and shell thickness

stable 3, 05.06.03 **(r = 0,29)**