

Cleaning and disinfection of layer houses systems for consumption egg production. (Karel Bossuyt – Lieven Dambre, CID LINES)

The poultry industry is a dynamic one and the egg producers, who are part of it, are no exception to the rule. The traditional cage ban that was imposed in EU beginning 2012 is a prime example of how the poultry production industry needs to be flexible and ready for changes in order to be sustainable today and in the future.

The main goal of the ban of traditional cages is to raise the hen welfare standards but what about the hygiene standards in the alternative layer housing systems? The cages scored well on egg -and hen hygiene and had relatively less dust flying around in them. Because the hens are occupying the layer house up to 58 weeks, a high level of soiling (manure, feed, dust, scale, etc.) can be expected. Which layer housing systems will also score well in terms of hygiene and are they easy to clean? The possibility to thoroughly clean and disinfect the layer house only comes by every 12-13 months. Farmers should take this opportunity to aim for a pathogen free (Salmonella etc.) house during this all-out phase before introducing the new flock into the layer house.

SWAB analyze

A trial has been conducted by Karel Bossuyt where 5 different layer housing systems were cleaned and disinfected. A comparison was made in labour, water consumption, product consumption and cleaning –en disinfection results between the different systems. The same cleaning company cleaned and disinfected all houses. In this way the modus operandi in terms of people and the equipment they used could not negatively influence the cleaning and disinfecting results (C&D results). The C&D results were analyzed by swabbing (RODAC plates). After incubation the remaining CFU's are counted in order to analyze the hygiene result. 25 plates were taken per layer house and this twice. One after cleaning and one after disinfection.

3 plates on the drinking system (pipe & drink cup), 1 on the egg belt, 1 on the hopper, 1 in the egg storage room (floor), 1 on the air inlet (grid), 3 in the laying nest grid, 3 on the laying nest side panels, 2 on the ceiling, 4 on the floor, 3 on the feeding system, 2 on the wall and 1 in the packing area.

The number of CFU's per plate are categorized by range and are given a score (table 1). The swabbing, the incubation, reporting and interpretation of the scores are executed by an official and independent laboratory. In this case it was done by dgz (animal health care Flanders, www.dgz.be).

table 1.

CFU per plate	Score
0	0
1 - 40	1
41 - 120	2
121 - 400	3
> 400	4
TNTC	5

There are 3 possible interpretations:

- score: $\leq 1,5$: The C&D procedure has been done properly and is approved
- score: $> 1,5$ and ≤ 3 : The C&D procedure has to be done again before a new flock can be introduced to the layer house.
- score: $> 3,0$: The C&D procedure has to be done again and this by a professional cleaning company, before a new flock can be introduced to the layer house.

DARE TO COMPARE

The 5 systems that were compared are an enriched cage system with a central egg collection belt (Easy80/100, Fienhage), a traditional cage system (UNIVENT, Big Dutchman), an organic free range system (side band nesting, vencomatic), an enriched cage system with colony housing (Specht) and an alternative housing system with winter garden (NATURA and manure pit system, big Dutchman).

It clear that each system has its own specific design and therefore the critical points for each housing system will differ. These CCP's will influence the cleaning result in terms labor costs. The time and personnel spend on dry and wet cleaning is taken into account. Some systems more easy to clean then others. Of course when something is difficult to clean the risk of it not being cleaned properly is bigger. This will reflect in the disinfection result as well hence a too high organic soiling will influence the disinfection negatively. This cause and effect mechanism creates a vicious circle where some spots can really become infection sources that recontaminate each new flock over and over again.

The detergent used for cleaning was KENOSAN (CID LINES) at 1,5%, except for the traditional cage system. Here only water was used for cleaning. The detergent was applied by a foaming. For disinfection 2 product were used, or VIROCID (CID LINES) or CID20 (CID LINES). Both products are well tested and have a strong bactericidal, virucidal and fungicidal action. The difference was situated in the application of the disinfectant. Some fogged (at 20-25%) the disinfectant and others foamed it (wet disinfection, at 1%). In table 2 the different methods are specified.

table2.

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Clean, cleaner, cleanest

In the easy80/100 the laying mats need to be pulled out of the nests and should be cleaned outside the layer house. Because this is a 2-floor system the dust and manure that comes from the 2nd floor needs to be evacuated to the 1st floor. A lot of dirt gets stuck between floors. These are the mean two reasons why this system is more labour intensive in terms of cleaning.

The traditional cage system was cleaned only with water which results in a poor average cleaning score of 4,6. In the organic system grids, drinkers and feeders are dismantled and cleaned outside the house. This explains the high amount of hours and people needed to clean a relatively small surface. The specht comfort 2-floor system proved to clean fairly easy. It scored on average 3,1. The critical points were the

laying nests. The NATURA manure pit system has no automatic manure belt but the drinking and feeders could be winched up which made the evacuating of manure easier. However all the floor grids needed to be dismantled and cleaned outside the layer house. The laying mats are also evacuated and cleaned in an automatic system outside. The cleaning score was 2,7 So a dry cleaning phase which is very labour intensive but if done properly, resulted in a very good cleaning score.

To fog or not to fog

Labour cost and product consumption is one thing but it's needless to say that the score at the end of disinfection needs to be equal or below 1,5 in order to consider the C&D protocol successful.

The graphs in table 3 the disinfection scores are shown for each swab point (25), the average disinfection score and the norm (DGZ).

table 3. graphs. Average disinfection scores layer housing systems

X

If we look at the disinfection results we see that in the traditional cage system and the organic free range system the disinfection did not was successful enough with a resp. score of 1,7 and 1,6. In the traditional cage only water was used to clean. The organic load was too high when the disinfection phase started.

The nests still score very high. The automatic sprayer system does not reach the nests efficiently.

The organic system only fogged 10L of CID20. With such a high lever soiling system, a wet disinfection is absolutely imperative. It will improve the contact of disinfectant with the surface dramatically. The grids are made of wood and therefore scored the worst: 3,5!

The easy80/100 just performed on the norm with 1,5. The floor and packing room score still above the norm.

Definitely the best scores were achieved with the enriched cage colony system and the Natura manure pit system with wintergarden with resp. 1,1 and 1,0. Both applied the disinfectant VIROCID by foaming. A simple foaming cup lance was used (see picture 1). In the natura system also a fogging phase was done after the wet disinfection. The score afterwards dropped from 1 to 0,8.

The different layer housing systems can influence the dry and wet cleaning phase but when this is done properly the disinfection results should not be influenced by them. Foaming the disinfectant when correctly applied (dosage) proved to be crucial for a clean and pathogen free layer house. Fogging should be seen as an additional measurement for disinfection executed after the wet disinfection.