

# **Survey of the different chicken housing systems and accumulating form of manure / slurry for the derivative of a standardised form of veterinary drug decomposition in expositions scenarios**

**Summary**



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**Summary**

by

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The legal foundations for chicken husbandry in the European Union are Directive 1999/74/EC (laying down minimum standards for the protection of laying hens), Directive 98/58/EC (the protection of animals kept for farming purposes) and Directive 2007/43/EC (laying down minimum rules for the protection of chickens kept for meat production). According to Directive 1999/74/EC, the use of unenriched cage systems will be illegal as from 2012. In Germany and some other member states, conventional cage systems are banned from January 2009. Throughout the EU, corresponding to Directive 2007/43/EC, the stocking density for broiler husbandry will be 33.kg/m<sup>2</sup> from 30<sup>th</sup> July 2010 onward. However, the new Directive allows, under compliance of additional obligations, a stocking density of 39 kg/m<sup>2</sup> and. 42 kg/m<sup>2</sup> respectively.

The Federal Statistical office recorded in 2007 75.829 farms with more than 3.000 chickens. In Total 72.883 of these farms kept laying hens and 8.680 chickens for meat production. Altogether 114.625.484 chickens (without counting turkeys, guinea fowls and bantan) were kept in Germany in 2007. In May 2007, 38.463.704 laying hens, 16.940.069 pullets and 59.221.711 broilers were registered in Germany. In Germany, the average size of chicken stock per farm in May 2007 was 760,2 laying hens and 6.822,8 broilers respectively.

In 2007, the German Federal Statistical Office had for the first time registered all farms with laying hens, i.e. stocks starting from one laying hen. In the previous years, only farms with more than 3.000 chickens were included in the official statistics. The main reason for the inclusion of all chickens is the threat of avian influenza.

One third of the German laying hen stock was found in Lower Saxony (13.387.828 LH). According to the statistical yearbook 2008, the majority of farms in all Federal States kept only one to 49 laying hens. The percentage of farms of this size of all farms was between 76 % in North Rhine Westphalia and 96 % in Bavaria. The biggest farms with 100.000 or more laying hens were situated in Lower Saxony. There were 29 Farms with 100.000 or more laying hens that kept in total 5.826.523 laying hens. With seven farms and 2.284.826 laying hens kept on these Saxony-Anhalt had the second largest number of farms with more than 100.000 chickens.

The percentage of cages systems in Germany decreased from 86,5 % in 2000 to 66,1 % in 2007. In 2007, the small group housing system was for the first time registered. They accounted for

only 1,5 % of laying hen husbandry. It is likely that this will increase because of the ban of battery cages from the 31.12.2008. The percentage of barn systems has nearly tripled since 2000. In 2007, 17 % of the laying hens were kept in barn systems. The percentage of free range systems fell from 14,4 % in 2006 to 10,9 % in 2007. One reason for this decrease was, that in 2007, organic farms were registered separately for the first time. In previous years, organic farms were added onto the percentage of free range systems. 4,4 % of laying hens were kept on organic farms in 2007.

Most of the farms which keep broilers, are located in Lower Saxony (1.845 farms), in Nordrhein-Westfalen (1.145 farms) and in Bavaria (866 farms). Just over half of the German broilers (31.586.145) were kept in Lower Saxony. The second largest broiler stock (5.026.954) was found in Mecklenburg-Vorpommern and Bavaria kept the third largest broiler stock (4.719.273). The majority of farms kept only very small broiler stocks. However, approx. 60 % of the broilers were kept in very big stocks (more than 50.000 animals). In the modern intensive broiler husbandry the animals are kept indoors the entire year. In Germany broilers are housed predominately on farms with big stocks in barn systems. In addition to intensive housing systems, a few Broilers, normally only on organic farms or farms with small stocks, are kept in extensive barn systems or free range systems.

The largest laying hen stocks in 2005 were found in the following member states: France (77.210.000 LH), Spain (59.980.000 LH), Germany (50.500.000 LH), Great Britain (49.010.000 LH) and Poland (48.580.000 LH). Europe-wide most laying hens were still kept in cages. Only 25 % of the animals were kept in alternative systems, i.e. 15 % in barn systems, 8 % in free range systems and 2 % on organic farms.

The chicken meat production in the EU-27 added up to 11,28 million tonnes in 2007, this equates to approx five billion slaughtered broilers. The most important producers were France with 16 %, Great Britain with 13 %, Spain as well as Germany each with 11 % and Italy with 9 %. In comparison to the laying hen husbandry there are no appreciable differences in the broiler industry throughout the EU. Barn systems were with almost 100 % the predominant housing system in all member states.

The term “chicken excreta” includes the mixture of faeces and urine excreted through the cloaca. This mixture also contains undigested feeding stuff, desquamated intestinal epithelium,

residues of secretion, microorganism out of the intestinal flora, metabolites excreted with the urine as well as exogen components (e.g. feather, egg leftovers). Chicken excreta are dried chicken excreta, fresh chicken excreta or chicken manure with a low grade of litter. Dried chicken excreta are accruing fresh chicken excreta without litter or with a very low ratio of litter that are dried as fast as possible after defecation in deep pit or on manure belt, so that the dry matter content is over 50 %. Dry chicken excreta can contain a low amount of crop litter and remains of feeding stuff or nitrogen content above 11 kg N/t fresh matter. Manure is a mixture of faeces and urine of animals as well as crop litter, usually straw and sawdust. Manure can contain remains of feeding stuff, cleaning water and run-off rain water. Solid manure is equated to chicken excreta that originate from chicken, turkey, duck, geese or other poultry fattening and have technological conditioned a high ratio of crop litter ( $\geq 7$  kg litter per day per 3 t increase of biomass per year) or nitrogen content under 11 kg N/t fresh matter.

Fresh chicken excreta contain the following nutrients: water 56 %, OS 26 %, N 1,6%,  $P_2O_5$  1,5 % and  $K_2O$  0,9 %. The nitrogen compounds consist of 60 % uric acid, 2 % urea, 6 % total ammonical nitrogen and 32 % nitrogen residues (decomposition products of protein). The nitrogen content of chicken excreta can be reduced by 10 to 20 % through needs-based feeding. Litter and housing system have an influence on the percentage of inorganic material in the manure. Laying hens kept in free range systems carry the soil from the chicken run into the barn so that the mineral content of manure is increased. On some farms the mineral content of the manure can be 70 %.

We developed a questionnaire, because the statistics provided none and the literature only a few data about the accumulation of manure and slurry. Even less information could be gathered about the use of litter materials. The questionnaire was sent per email, fax or mail to 680 farms. 89 questionnaires were returned. 27 questionnaires were send back by conventional farms and 62 by organic farms. 22 farms of the 27 conventional holdings kept laying hens and 5 farms broilers. 53 farms of the 62 organic holdings kept laying hens, 8 farms laying hens as well as broilers and 1 farm broilers. Five of conventional farms still had battery cages. Cage systems are not allowed on organic farms, so this housing system does not exist on organic holdings. On organic farms free range systems are the predominant housing system, whereas only 5 conventional farms keep their laying hens in free range systems. The good half of the conventional farms with egg production keeps their laying hens in barn systems. In the

chicken meat production on conventional farms, barn systems are already the predominant housing system. Almost all boilers are kept in barns systems. In summary it can be said that sawdust is the predominant litter material on conventional farms and straw the predominant litter material on organic farms. Straw and sawdust are the most often used litter materials in all housing systems, but there are also many other used litter materials like spelt husk, soil and hay. Dry manure is the predominant type of manure / slurry in all lines of production. On conventional farms with meat production dry manure is the only type of manure / slurry that accumulates. Slurry accrues only on one conventional farm, which keeps laying hens in battery cages. Two organic farms that house laying hens in free range systems ticked slurry on the questionnaire, but can't have slurry, because in free range systems only manure or dry excreta accumulate. It was not possible to calculate the average amount of accumulating manure per laying hen or broiler, because there were great discrepancies between the filled in amounts.

It is impossible to calculate the amount of manure and/or dry excreta for the German chicken stock because it depends on various factors like housing system, litter material, dry matter content, feeding stuff, breed, size of chickens etc. The amount of slurry can be neglected. In the questionnaire survey only one farm, which keeps laying hens in battery cages, produced slurry. Due to the ban of battery cages in Germany this farm has to establish another housing system and therefore slurry will no longer occur on this farm. According to the asked institutions slurry should no longer accumulate in laying hen husbandry.