

# Solutions and consequences to end chick culling



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# Introduction

Every year, around **330 million one-day-old male chicks** are culled in the **egg industry in Europe** after hatching. This is **due to their inability to lay eggs and because their fattening is not economically profitable compared to broilers.**

The **pioneer country to put an end to this practice is Germany**, which banned chick culling in its hatcheries since first of **January 2022**. Indeed, Germany already informed in 2015 for the first time that they would like to ban this practice as soon as methods of gender identification in the hatching egg were available on the market.



# Solutions

There are currently **three solutions** in the German poultry sector to end chick culling:



**a) Dual-purpose breeds:** They are crosses of laying hens with broilers, where the females are used for egg production and the males for meat production. **The laying performance of dual-purpose breed hens is lower than that of laying hens** and, analogically, **the meat performance of dual-purpose breed males is lower than that of broilers.**



The **advantages** of the dual-purpose breeds are the following:

- ▶ It is well accepted by consumers and NGOs because both males and females have a purpose.
- ▶ There are some initiatives and market niches in Germany.
- ▶ There is less animal suffering of laying hens due to their lower performance and, therefore, they have less diseases, stress, and cannibalism.

**X** The **disadvantages** related to the **egg performance** are the following:

- ▶ Laying hens from dual-purpose breeds lay around 20% less eggs ( $\approx$  250 eggs) than laying hens breeds ( $\approx$  350 eggs) in the same laying period.
- ▶ **Their eggs are significantly smaller** and, therefore, the percentage of marketable eggs are lower than the eggs of laying hen breeds.
- ▶ Consequently, eggs from dual-purpose hens are only profitable in organic market niches.



**X** The **disadvantages** related to the **meat performance** are the following:

- ▶ **Dual-purpose males have significantly lower meat performance than broiler breeds** specially a lower percentage of breast meat (part of the carcass most valued by consumers).
- ▶ The feed conversion is around 50% lower than broilers.
- ▶ The **fattening period** is 2-3 weeks **longer to achieve the same weight** than broiler breeds.
- ▶ There are no legal regulations for rearing and fattening dual-purpose breeds.
- ▶ Due to the low weight and carcass of these animals at slaughter, technical problems arise in slaughterhouses.
- ▶ It is **only profitable in organic market** niches due the high prices.

**b) Brother layer fattening**, i.e., the fattening of the male chicks.

- ✓ The **advantages** are similar as the dual-purpose breed but with a big advantage:
  - ▶ The egg performance remains and, therefore, there are no losses in egg production.

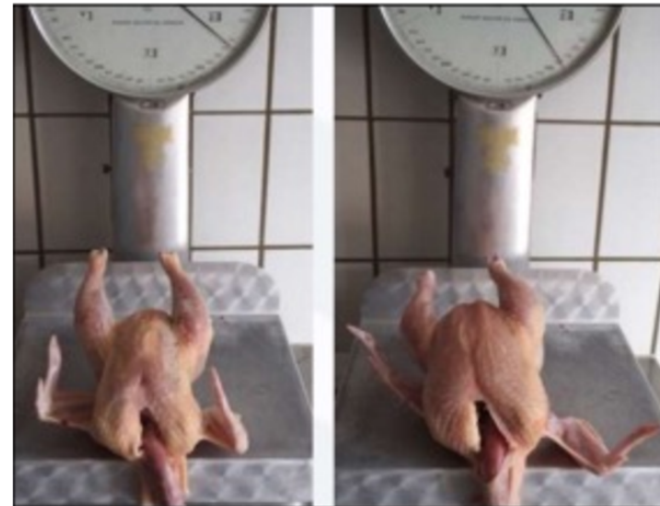


**Figure 1.** From left. to right, five-week-old chickens: Lohmann Brown Plus chicken (brother of laying hen), Lohmann Dual chicken (dual purpose-breed), and Ross 308 chicken (broiler) (Malchow, 2019).



The **disadvantages** are the following:

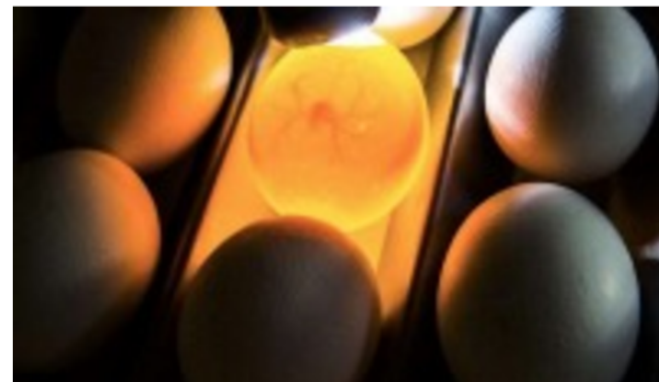
- ▶ **The meat performance of the males is even worse than the one of dual-purpose males.**
  - ▶ The **fattening period is much longer** than for broiler breeds to achieve the same body weight. Consequently, **the males can achieve the sexual maturity** and starting to fight, which also makes rearing difficult.
  - ▶ There are no legal regulations for rearing and fattening the males.
  - ▶ Due to the low weight and carcass of these animals at slaughter, technical problems arise in slaughterhouses.
- ▶ There is no demand for the meat because the males will not replace broiler breeds. Therefore, most of the males are fattened in Poland and slaughtered with a low weight to be exported frozen to Africa. This practice increases the critics by NGOs.



*Dual breed male vs. slow growing broiler after 70 fattening days.*

**c) Gender identification** in the hatching egg i.e., male hatching eggs are sorted out before hatch and only female chicks hatch. There are about 15 methods worldwide but only four are practicable in Europe. They differ in the date of determination, the method of analysis, their marketability and acceptance by consumers and NGOs. Three different approaches can be distinguished:

- ▶ **1. Optical processes:** Hyperspectral analysis can identify the gender of brown breeds on the unopened hatching egg on the 14th day of incubation from the growing feathers of the embryo. This process is already used in Europe. Spectroscopy can determine the sex on the 4th-5th day of incubation through a hole in the eggshell -but is not yet ready for the market. There are further research projects on the analysis through the closed hatching egg on the 4th-5th day of incubation.
- ▶ **2. Liquid-based processes:** On the 4th day of incubation, the allantois bladder develops in the hatching egg. This is largest on the 9th day of incubation. The allantoic fluid can be analyzed by endocrinology, PCR or MRI analysis to determine the gender of the hatching egg.
- ▶ **3. Genetic engineering processes:** Various approaches using CRISPR attempt to terminate the development of the male embryo early or even make it recognizable before incubation by fluorescent light, which *is not well accepted in Europe*. This research is mainly taking place in Israel and Canada. The practical maturity of these processes is uncertain.





The **advantages** of gender identification in the hatching eggs are the following:

- ▶ This solution to end chick culling **is the most cost-effective because there is no increase of the feeding needs for males.**
- ▶ It **is the most sustainable solution** because there is no waste of raw materials, there is a circular use of nutrients since the male hatching eggs are used for feed production.
- ▶ **The CO<sub>2</sub> footprint of the table egg is lower with this solution** than fattening the males of dual-purpose breeds or laying hens.
- ▶ The logistics of the supply chains are much easier.



The **disadvantages** of gender identification in the hatching eggs are the following:

- ▶ It is not well accepted by more conservative groups who consider that the problem is only moved forward by culling embryos instead of one day-old chicks.
- ▶ There is a big uncertainty about the beginning of the embryos pain perception.



Day 9 of incubation.  
Size of the embryo: 3 cm.



Day 15 of incubation.  
Size of the embryo: 15 cm.

# Conclusion

**Animal welfare is increasingly requested** by consumers and NGOs.

The reasons to chick culling are not accepted anymore and, therefore, the poultry sector is looking for alternatives.

Three solutions have already been implemented in the German poultry sector, and dual-purpose breeds and brother layer fattening have presented great disadvantages compared to the gender identification in the hatching egg.

Fattening the males requires longer fattening periods to reach optimal live weight than broilers breed, and it is not economically rentable because of the high feed costs due to the bad feed conversion.



**It is unsustainable because of the waste of raw materials and the higher CO<sub>2</sub> production** compared to gender identification in hatching eggs.



Gender identification in the hatching eggs is becoming the most desired solution because it is the most cost-effective and sustainable solution to end chick culling.

# Thank you!

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