

## Consumers' Perspective on Dual-purpose Chickens as Alternative to the Killing of Day-old Chicks

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### ABSTRACT

The usage of dual-purpose chicken breeds – a chicken breed which provides meat and eggs at the same time is one of the discussed alternatives to prevent cockerel chicks of laying hens from being killed for economic reasons. Therefore, the aim of this study is to analyse consumers' perspective on dual-purpose chickens. To get an insight into consumers' perspective, we initially conducted six focus groups with German consumers focussing on their chicken meat and egg preferences, perception of chicken farming and attitudes towards dual-purpose chicken breeds. The results show that most of the participants were aware of the killing of day-old chicks. However, alternatives were scarcely known. After giving the participants information about dual-purpose chickens, they were generally in favour of this chicken breed. Some participants raised concerns regarding the economic efficiency and the higher product prices. For others, ethical values predominated. All in all, the results demonstrate that the discussants have specific expectations regarding the husbandry conditions but also regarding the product characteristics and the labelling of dual-purpose chickens.

**Keywords:** *consumers; dual-purpose chickens; perception; focus groups; day-old chicks*

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## 1 Introduction

In Germany, annually more than 40 million male chicks are killed after hatching. The killing of day-old chicks is common practice in the commercial production of laying hens because the fattening of cockerels from laying breeds is unprofitable. The sex determination in the egg<sup>1</sup>, the fattening of layer-type males<sup>2</sup> or dual-purpose breeds are alternatives to the killing. Breeders of dual-purpose chickens are facing the problem that meat growth and the number of eggs are negatively correlated. Therefore, the hens lay fewer and smaller eggs and the cockerels put on less meat and need more time and feed to grow. Consequently, eggs and meat from dual-purpose chickens have a foreign appearance to consumers and are more expensive than products from chicken breeds which are either specialized for meat or egg production.

Farmers and breeders potentially need to adopt marketing strategies to increase consumer acceptance of dual-purpose chickens because this is essential for market success. Aim of this study is to gain first insights into consumers' perspective on dual-purpose chickens as there is a great need for research regarding the emerging debate on killing day-old chicks and possible alternatives (Leenstra et al., 2011; Bruijnjs et al., 2015). Thus, several research questions arise. First, are consumers aware of the killing of day-old chicks and do they have moral concerns? Second, what is the reaction to the concept of dual-purpose chicken breeds? Third, whether and under which conditions would consumers buy products from dual-purpose chickens and would they be willing to pay a surcharge? In section two of this paper the background of the topic and relevant literature on consumers and dual-purpose chickens are presented. Then, the method is described and followed by the results of the focus groups. The paper concludes with the discussion of the results.

## 2 Background

Since the 1950s the industrialization and prosperity of society led to a growing demand for animal products. The increasing demand for chicken meat and eggs and new opportunities in sexing at hatch resulted in a specialization in chicken breeding. Nowadays, there are genotypes specialized in meat growth and genotypes that are specialized in egg production (Leenstra et al., 2010; Grashorn, 2013). As a result, in the breeding of laying hens there is only use for the female animals as the fattening of layer-type males is unprofitable due to the negative correlation between meat growth and laying performance and therefore the males do not put on sufficient weight. For this reason, it is common practice that male layer-types are killed as day-old chicks, in conventional as well as organic farming (Rautenschlein, 2016).

In Germany, the consumption of chicken meat and eggs is still slightly increasing. In 2016 the per capita consumption was 20.9 kg, in 2006 the average consumption was 16.7 kg (BMEL, 2008, 2017a). Additionally, the Germans consumed on average 234 eggs in 2016 (BLE, 2017), and therefore 25 more eggs than in 2006 (BMEL, 2008). At the same time, animal husbandry is in the focus of public criticism. Especially the keeping of laying hens and the broiler production are seen more sceptical than other animal husbandries (Verbeke and Viaene, 2000; Vanhonacker and Verbeke, 2009; Sossidou and Elson, 2009; Heng et al., 2013; Faucitano et al., 2017). Besides critical aspects like stocking density, antibiotics and farm size, the society is becoming increasingly aware of the killing of day-old chicks (Bruijnjs et al., 2015). The debate in Germany intensified in May 2016 when a court in North Rhine-Westphalia decided that the killing of male chicks is in line with the animal welfare legislation. The reason given for this is the fact that the fattening of layer-type males is economically inefficient and technical solutions are not yet practicable (Beckmann, 2016). The practice raises moral concerns not only among consumers (Aerts et al., 2009) but is also an issue on the political agenda. That is why the German Ministry of Food and Agriculture is funding research in the field of sex determination in the egg as well as in the field of dual-purpose chickens with the aim to stop the killing of chicks (BMEL, 2017b).

Dual-purpose chickens are one alternative to the killing of day-old chicks. They can do both: produce meat and lay eggs. The hens lay fewer eggs and the cockerels put on less meat and need more time and feed to gain weight and therefore more resources (e.g. land, water) (Koenig et al., 2012; Damme, 2015). Consequently, eggs and meat from dual-purpose chickens have a foreign appearance to consumers and are more expensive than products from hybrid chickens. To a great extent the eggs are smaller (mainly

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<sup>1</sup> Sex determination in the egg implies that the sex of the embryo can already be detected in the hatching egg and the eggs with male embryos are not further incubated (Bruijnjs et al., 2015).

<sup>2</sup> Fattening of layer-type males means that male layer-type chicks are not culled but fattened despite their poor meat growing performance (Damme and Ristic, 2003).

small and medium sized) and colored light beige. The meat of the cockerels has a firmer consistency and a darker color (Grashorn, 2013; Rautenschlein, 2016). Additionally, the share of breast meat, which enjoys great popularity in Germany, is much smaller compared to conventional broilers. Therefore, dual-purpose chickens are less suitable for the marketing of cuts like chicken breasts (Kaufmann et al., 2016).

With the help of a qualitative study Kennedy et al. (2004) investigated consumer perceptions of poultry meat and identified appearance (e.g. meat color and form) as indicator for quality. Other important factors when buying chicken meat were value (e.g. healthiness and taste) and convenience (described as preference for chicken breast fillet, whereas the cooking of a whole chicken was perceived as traditional). In the case of eggs, Guyonnet (2012) looked at several studies dealing with consumers' attitudes towards eggs and egg products. According to the author, the prevailing eggs buying decisions depend on the price, the freshness, the remaining shelf-life and the quality of the eggs.

The role of consumers is essential for the success of products from dual-purpose chickens. At the same time consumer behavior is the most unpredictable part of the supply chain (Terlau and Hirsch, 2015). Ethical issues including animal welfare, environmental issues and human rights are gaining in importance within society (Schröder and McEachern, 2004; De Backer and Hudders, 2015). The Eurobarometer report (European Commission, 2016) has shown that the protection of farm animals is very important to 61% of the German respondents and 42% of the surveyed Germans stated that they would be willing to pay a surcharge of more than 5% for products from animal-friendly production systems. However, what people say is often not reflected in their real purchase behavior and attitudes are not always followed by the intentions. This phenomenon is called attitude-behavior-gap (Homer and Kahle, 1998; Vermeier and Verbeke, 2006). According to Auger and Devinney (2007) the problem of this inconsistency often lies in the survey methods (e.g. rating scales) as they have a big effect on the results. Especially, sensitive ethical issues could encourage consumers to respond in a socially acceptable way. Consequently, a combination of methods is recommended to achieve more reliable results.

Leenstra et al. (2011) conducted a study focussing on the public opinion on alternatives to the killing of day-old chicks in the Netherlands. With the help of focus groups and an online survey they found out that 58% of the respondents were not aware of the killing of day-old chicks. The participants were informed about the alternatives by a documentary film and were then asked about their perceptions. Regarding the concept of dual-purpose chickens, the results show that it was seen positive but also as unrealistic on grounds of the two-fold increase in prices for eggs and chicken meat. In a ranking with other alternatives, the dual-purpose chicken was ranked second from five potential alternatives directly after the sex determination in the egg. The study also revealed the complexity that consumers as well as experts are facing when evaluating different alternatives to the killing of day-old chicks with limited information. In a study of Bruijns et al. (2015) the killing of day-old chicks and the alternatives sex determination in the egg as well dual-purpose chickens were ethically evaluated. Therefore, they identified four stakeholder groups with the assistance of experts: society, egg-sector, day-old chicks and the environment. They used an ethical matrix in order to evaluate the perspectives with regards to the ethical principles wellbeing, autonomy and justice. The findings show that the killing of day-old chicks is problematic from the ethical point of view. But also the two alternatives raise new ethical dilemmas like e.g. between animal-friendly and environmentally-friendly production and therefore, there is no morally sound solution to the problem. According to Bruijns et al. (2015) better innovations that are free from dilemmas are needed in this field.

Gremmen and Blok (2016) also dealt with the ethical evaluation of the topic and applied the ethical matrix to compare the use of dual-purpose chickens and in-ovo sex determination to the current situation of killing day-old chicks. Building on this, the authors conducted an online survey with 1,022 respondents in the Netherlands. The results show that 55% were aware of the killing of day old chicks and 30% of the respondents agreed with this practice. The most preferred alternative (20.7%) was the use of GM techniques which prevents from the killing of chicks and embryos followed by the fattening of layer-type males (18.2%) and the use of dual-purpose chickens (15.9%). The findings also show that there is no clear preference for dealing with the killing of day-old chicks.

A swiss study conducted by Gagnat et al. (2018) focusses on the willingness to pay for meat and eggs from dual-purpose poultry. The authors used questionnaires in eight grocery stores with 402 respondents in total. The questionnaires included questions regarding consumption frequency, purchase habits, knowledge about chicken husbandry and statements questions in order to capture attitudes. Additionally, dual-purpose poultry was introduced as alternative to the killing of chicks and the respondents were asked about their willingness to pay (WTP) for dual-purpose poultry products. According to the authors, respondents' WTP for dual-purpose poultry meat and eggs lies between the prices for conventional and organic products and was comparatively higher for eggs.

Additionally, the WTP mainly depends on the degree of knowledge about agriculture, the types of products that are usually bought by the respondents and the familiarity with dual-purpose poultry.

### **3 Method**

In Germany, no studies have been conducted on consumers' perception of dual-purpose chickens yet. For this reason, an inductive qualitative method approved as appropriate way to analyze this complex and still unexplored topic. As a consequence of a rapidly changing world and emerging challenges inductive methods gain in importance because they can respond better to changes in the social context than deductive approaches (Flick, 2009). To generate qualitative data, we conducted focus groups. Focus groups are an empirical research method with focus on group dynamics and interactions between participants (Finch and Lewis, 2003). According to Morgan (1997:6), "focus groups are a research technique that collects data on group interactions on a topic determined by the researcher". The aim of focus groups is to create an atmosphere that fosters an almost natural conversation setting with diverse opinions and statements (Lamnek, 2005). Furthermore, by responding to other participants, the conversation setting leads to deeper insights in motivations and justifications and stimulates new thoughts (Finch and Lewis, 2003). Therefore, this method is particularly suitable for the detection of perceptions and needs of consumers and the identification of aspects that need to be considered in a standardized survey. Focus groups do not replace representative surveys (Kuß, 2007).

Focus groups are normally conducted with a small group of six to ten people (in our case strangers) who discuss about a given subject for 60-120 minutes. The discussion is guided by a moderator. The interactive group setting is structured by a questioning route and the role of the moderator is to encourage the participants to express their opinions, but also to keep the discussion on track and ensure that all discussants contribute (Kühn and Koschel, 2011). We created a questioning route with the help of experts in the field of chicken farming. The questioning route was semi-structured in order to get comparable results, but also with the aim to stay flexible and to keep the explorative character (Lamnek, 2005). Discussion topics were preferences for chicken meat and eggs, the perception of chicken farming, known alternatives to the killing of day-old chicks and the concept of the dual-purpose chickens including advantages and disadvantages as well as purchase criteria.

In June 2016, we conducted six focus groups with each seven to nine participants (total number of 47 participants) in Berlin, Munich and Cloppenburg (town within intensive poultry region in Lower Saxony). People with a professional background in agriculture, food industry or market research were not recruited. In addition, quotas concerning age (between 20 and 70 years old), gender (share of males and females between 33.3% and 66.6%) and employment (rate around 67%) were fulfilled in order to ensure heterogeneous groups. The discussions were scheduled for 90 minutes and the participants received incentives. The participants were identified by a market research company and all of them were consumers of poultry meat and eggs. The discussions were documented by audio and video and after that verbatim transcribed. The transcripts of the focus groups were evaluated content-analytically according to Mayring (2015). The discussion topic was not announced in advance in order to avoid that the participants familiarize with the topic and are biased. Questions that were raised directly to the moderator in the course of the discussion were not answered and despite a standardized information text about dual-purpose chickens no additional information was given.

### **4 Results**

#### **4.1 Purchase criteria for chicken meat and eggs and consumption habits**

At the beginning of the discussions the participants were asked for their consumption habits and purchase criteria regarding chicken meat and eggs. According to the discussants, chicken meat was purchased mainly in supermarkets and discount stores or sometimes in organic food stores. Some stated that they would buy the meat directly on the farm or on the local market. The most named purchase criteria were the meat color, the best-before date and a regional origin. Organic production was an aspect which was also named frequently. Some participants stated that they would not be able to afford organic chicken meat and would therefore buy conventionally produced chicken meat. On this aspect, it was also mentioned that husbandry conditions would be difficult to understand based on the packaging because besides the organic label there is usually no declaration of the husbandry system on chicken meat. With respect to consumption habits, it became clear that the discussants prefer cuts like chicken breast or

wings to a whole chicken. Reasons that were mentioned were “it is too much meat for me alone”<sup>3</sup> or “I do not like bones”. Few discussants said that they would sometimes buy a whole chicken primarily to cook chicken soup.

Eggs were also purchased by all discussants. According to the participants, eggs were bought in supermarkets and discount markets, on the local market, in organic food stores or if possible directly on the farm. Regarding the husbandry system only some discussants said that they would not pay attention to it. To other discussants this aspect was very important and they looked especially for free-range or organic eggs. An interesting point was that some participants differentiated between eggs for cooking and baking and boiled eggs for breakfast and, therefore preferred organic or free-range eggs as breakfast eggs, whereby the origin of eggs for processed food was indicated as less relevant. The egg color was not mentioned as a relevant purchase criterion. Few discussants stated that they would buy explicitly white or brown eggs because of their association with the husbandry conditions. Only at Easter white eggs seemed to be more preferred as they can be colored. Regarding the egg size, the opinions were more diverse. Some discussants stated that they would not pay attention to the egg size whereas others said they would look for preferably big eggs. One discussant was unaware that different egg sizes exist. All in all, the husbandry system, a regional origin, the best-before date and the intactness of the eggs were named as purchase criteria for eggs.

#### 4.2 Perceptions of chicken farming in general

The perception of chicken farming was dominated by terms like “factory farming”, “lack of transparency” and “greed for profit”. Regarding the husbandry of laying hens the discussants were mainly concerned about the feed. It was presumed that the hens would be fed with “rubbish” and this is reflected in the egg quality. The topic beak trimming was also mentioned in this context. The picture of hens in battery cages, where the hens are packed together and have no space to move was still present although these battery cages are forbidden in Germany since 2010. The fattening of broilers was associated with broilers that have to eat all day to gain weight. The discussants assumed also that there would be no human-animal interaction and that the stable workers would not handle the animals appropriate. The prophylactic use of antibiotics was also often mentioned by the discussants and harshly criticised when they were asked for their perception of chicken farming in general. According to some participants, free-range husbandry best meets their expectations.

#### 4.3. Moral concerns and reactions to the concept of dual-purpose chickens

The topic killing of day-old male chicks was addressed in every focus group without being mentioned by the moderator. Most of the participants stated to know about this practice. This could be attributed to the fact that the topic was present in the media at that time because of the court ruling dealing with the killing of male chicks. Regardless, many discussants expressed their disgust at the killing of day-old chicks. Statements such as “imagine, they were humans. Shredding the boys and feeding them to animals. That’s terrifying” or “they kill all the men” underline that humanization of farm animals also plays a role when it comes to this topic. Most of the discussants agreed that the killing of chicks is clearly unacceptable from the moral point of view and they demanded to stop the practice. Others claimed that the chickens would be killed anyway and that it does not matter if sooner or later. Discussing the reasons, it was assumed that “it’s for profit reasons” and “they don’t have enough meat growth”. Additionally, it was mentioned that consumers could not change the situation because they would be powerless compared to the industry.

Asked for alternatives few were known by the participants. Sex determination in the egg was one alternative that was named several times. Some participants also mentioned the fattening of layer-type males as a potential alternative to the killing of day-old chicks, whereas the use of dual-purpose chicken breeds was not mentioned once. When the participants were asked if they have an idea what is meant by the “dual-purpose chicken” few could think of anything. The participants responded for example: “I have no idea what could be meant. Do they have two heads?” or “it sounds like they were produced in a factory”. The discussants agreed that the naming is inappropriate and causes misleading associations.

Since the focus of this study is on consumers’ perspective on dual-purpose chickens, at this stage of discussion the concept of this chicken breed was explained to the participants. Therefore, following text was presented to the discussants: *Dual-purpose chickens are a breeding line where both, the male and the female animals can be used. The males are kept for meat production and the females still lay enough eggs to be kept as laying hens. The eggs of the hens are slightly smaller than „typical” eggs and fewer eggs are*

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<sup>3</sup> Citations were translated from German into English.

laid per year. This is reflected in a higher price. The male chickens have a longer fattening period than "typical" broilers. For this reason, much more feed is needed and the meat is correspondingly more expensive.

After the concept was presented, the reactions were mostly positive but concerns were also raised. The positive aspects that were named were primarily ethical and moral aspects, that include that the life of the males is saved. Others presumed that the meat quality could be better due to a longer fattening period and slower meat growth. The most frequently named negative aspect was the higher price for meat and eggs from dual-purpose chickens. Some participants described a dilemma between saving the life of male chicks and having to pay more for chicken meat and eggs as they saw a conflict between moral aspects and a limited budget for food. Other aspects that were named in this context were the presumption that the fattening of the cockerels would be economic inefficient. Only one discussant remarked that too many resources would be used to produce meat. Another important point that was stressed by some discussant was the fear that genetic engineering would be used to breed dual-purpose chickens.

#### 4.4 Purchase criteria for products from dual-purpose chickens

In the end, the participants were asked to name potential purchase criteria for the case that they would buy meat and eggs from dual-purpose chickens. The criteria that were explicitly named were collected and written down on a flipchart. After that, the discussants were given six stickers each and they had to assign three stickers to the most important aspects for chicken meat and three stickers to the most important aspects for eggs. Discussants could see each others' rankings of purchase criteria and, therefore the answers could be biased by other participants' rankings. The following table shows the number of stickers that the respondents assigned to the before named potential purchase criteria (not all participants used all their stickers).

**Table 1.**  
Discussants rating of potential purchase criteria regarding dual-purpose chickens

potential purchase criteria	chicken meat	eggs
better husbandry conditions	25	31
taste	21	17
declaration of origin	18	20
price	14	12
no GM techniques	10	10
better controls	9	7
product freshness	9	4
good quality	6	7
no killing of male chicks	6	2
regional origin	3	2
less antibiotics	3	4
healthy and robust breed	3	4
good feed	2	1
declaration as dual-purpose chicken	2	7
small farm size	2	1
big egg size	-	2
other aspects	8	6
number of assignments	n = 141	n = 137

During the discussions it became clear that for many participants the prevention from killing day-old chicks is not enough and they would only buy products from dual-purpose chickens if the husbandry conditions would be improved as well. As examples for better husbandry conditions "good feed", "no antibiotics", "much more space" and "litter" were named. Another important point that was often named, was a good taste with emphasis on the meat. As shown in Table 1, the declaration of origin was also a notable criterion for the discussants. In this context, some discussants suggested e.g. "the address of the

chicken farm on the package” as indication of origin. As expected, the price also plays a role as a purchase criterion when it comes to dual-purpose chickens. GM techniques were another important subject of discussion. Some participants presumed that dual-purpose chickens could be genetically modified and they strongly opposed GM techniques. Further listed criteria were often connected to quality aspects like product freshness.

When the discussants talked about the prices of dual-purpose chicken meat and eggs, the majority of the discussants stated that they would pay a surcharge for meat and eggs on the grounds of “sympathy with the chicks” or “to eat meat with a good conscience”. “It depends on how much more I have to pay” was also often mentioned by the discussants. In the case of eggs, some discussants indicated to be willing to pay a surcharge of 50 percent. For meat, the willingness to pay a surcharge seemed not that high. “I would pay a surcharge of 20 percent if the meat tastes better” and “I would not pay additional 10 Euro”. Paying more money for the meat and therefore reduce the consumption of meat was seen as the solution by several discussants. Few participants said that they would not be able or willing to pay a surcharge.

## 5 Discussion

The focus group discussions have shown that the participants prefer to buy chicken cuts and hardly ever cook a whole chicken. This is also reflected in the study of Kennedy et al. (2005). Regarding chicken meat it was remarked that husbandry conditions are difficult to understand on the basis of the packaging in contrast to eggs where the husbandry system was indicated as an important purchase criterion. Some discussants stated to prefer large eggs, whereas the egg color did not seem to be relevant. These results could have implications on the potential marketing of eggs and meat from dual-purpose chickens and should be considered in further process.

Although all participants of the focus groups were consumers of chicken meat and eggs, the perception of chicken farming was mainly negative and associated with words like “factory farming” and “antibiotics”. This results accord with previous studies (Verbeke and Viaene, 2000; Vanhonacker and Verbeke, 2009; Heng et al., 2013) that dealt with consumer attitudes on laying hens and broilers. Compared to the study of Leenstra et al. (2011) where only 42% of the respondents knew about the killing of male chicks, our discussants stated to be mostly aware of the killing of day-old chicks. One reason could be that the topic was very present in the media at that time and the issue is increasingly addressed by politicians and NGOs. Most of the discussants refused to accept the practice on the grounds of moral concerns and got indignant about it. However, alternatives to the killing were scarcely known. According to Gremmen and Blok (2016) there is no clear preference for one alternative and Leenstra et al. (2011) found out that the topic is very complex and respondents experience difficulties when they have to rank the alternatives with limited information. These results were also reflected in the conducted focus groups where the concept of dual-purpose chickens was not known. After presenting the concept of dual-purpose chickens, the participants had difficulties to imagine what is meant by the name dual-purpose chicken (Zweinutzungshuhn). In general, the participants were in favor of the dual-purpose chicken breed but they also raised concerns and revealed dilemmas. For example, they presumed that genetic engineering is used or that the fattening of the cockerels is economic inefficient. Identified purchase criteria were a clear labelling of meat and eggs from dual-purpose chickens and improved husbandry conditions for the chickens. Regarding the willingness to pay a surcharge, the opinions were diverse. Most of the participants said that they would be willing to pay an additional charge with the aim of eating meat and eggs with a good conscience. Some stated not to be willing or able to pay more for products from dual-purpose chickens. However, it should be noted that this statements have to be interpreted with caution as it can be often observed that there are inconsistencies between attitudes and actual purchasing behavior (attitude-behavior-gap).

In conclusion, the findings show that the participants were interested in the topic and that they have specific expectations (e.g. labelling or husbandry conditions) regarding products from dual-purpose chickens. Therefore, it is important to take consumers’ perspective into account when discussing alternatives to the killing of day-old chicks. This study provides a first glance at consumers’ perspectives and gives valuable information on a topic that has not been studied adequately in Germany yet. Especially for producers, breeders and other actors in this field, it is essential to learn more about consumers’ view on dual-purpose chickens as they are the ones responsible for the market success in the end. The results of the focus groups are not representative. Therefore, the findings were used to develop a questionnaire. In February/March 2017 a representative online survey (n = 1,502) was conducted in order to quantify the results and to carry out a choice-experiment with the aim to find out more about preferences and willingness to pay for meat and eggs from dual-purpose chickens.

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