


Animal Welfare Protocols and Labelling Schemes for Broilers in Europe

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Abstract

Nowadays, consumers are becoming increasingly concerned about the husbandry conditions under which animals are raised, particularly broilers, since broilers are one of the species whose welfare is most impaired in intensive farming systems. One of the primary means of communicating husbandry practices to consumers is through product labelling. Thus, a rising number of animal welfare labelling schemes for broilers are being developed and used across Europe by initiatives of both public and private stakeholders, including NGOs that advocate for animal welfare. This review aims to identify, analyze, and compare these labelling schemes with a focus on the main animal welfare provisions included in them, which contribute to enhanced animal welfare. The schemes were identified through web searches, so that we could visit their official websites, access their standards and regulations and study them in detail. We included in our research only those schemes whose criteria were publicly available. In total, 16 schemes were selected and analyzed. Although these schemes vary in their criteria, they all enhance the welfare standards of broiler production, primarily through incorporating environmental enrichment and/or access to the outdoors. Most schemes define and specify in detail the required animal welfare provisions, setting a clear application frame for the raising period of the birds. However, the welfare of animals during transport and slaughter is often overlooked.

Keywords: chicken meat; meat labelling; broilers; animal welfare assessment; environmental enrichment; positive welfare indicators; labelling scheme; animal welfare protocol



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1. Introduction

In 2016, the United Nations Committee clearly established animal welfare as a pillar of sustainable agricultural development, underscoring the connection between animal welfare, the environment, and sustainability, specifically stating that improving animal welfare can contribute to addressing environmental challenges, achieving sustainability goals, and ameliorating human health [1]. Furthermore, initiatives from non-profit organizations reinforce this direction, such as “One Health” [2] and “One Welfare” [3], which treat both the health and welfare of humans and animals as unified concepts, while also highlighting their connection to the environment. As a result, according to the vast majority of the consumers, foods that come from farms with a higher level of animal welfare than the minimum required by legislation are considered to be of better quality [4,5].

This creates the need to communicate the conditions of animal husbandry practices to the consumer, which can be achieved mainly through food labelling. The European Union

has established Regulation 2018/848 that lays down the minimum rules on the production and labelling of organic products, which requires animals to be raised under improved conditions compared to conventional farming systems. Member States are allowed to establish stricter rules at the national level, and many have already done so, but as a minimum obligation, they should accept the requirements set by the regulation. At the same time, due to growing interest in sustainability and animal welfare, more and more protocols are being developed at the European level, either through government initiatives or initiatives by non-profit organizations and private entities [6,7]. These standards certify animal-based products from farms with a higher level of welfare, often greater than the minimum referred by the legislation on conventional farming and typically higher than the level defined by Regulation 2018/848 for organic farming [7]. In this direction, the “Farm to Fork” strategy introduced by the European Union in 2020 played a significant role, highlighting the importance of product labelling as a means to inform consumers about the sustainability of the production process, the nutritional value of food, and the level of animal welfare on farms, emphasizing the need for transparent and understandable labelling [7,8].

Meat consumption is expected to increase at a rate of 14% by 2030 compared to 2020, particularly in developing countries, due to the growth of the global population [9]. Chicken is the most consumed meat globally, with the consumer’s preference for it over other types of meat becoming greater, as it is considered an economically affordable, nutritious, and healthy choice. By 2030, its consumption is expected to increase and is projected to account for 41% of total global meat consumption [9].

The intensification of chicken production has significantly impaired broilers’ welfare. Among the major issues faced by broilers in intensive systems are high stocking densities, poor ventilation conditions, musculoskeletal and cardiovascular problems due to rapid weight gain, beak trimming, stereotypic behaviors [10,11], and even cannibalism [10]. According to consumers, it is the production species with the worst welfare [4]. Thus, consumers in Europe are willing to pay, on average, 25% more for chicken from husbandry systems where birds are raised under improved welfare conditions compared to conventional systems [12]. Research shows that consumers are willing to pay a higher price for certified organic chicken [13], chicken from slow-growing breeds [14], or chicken from dual systems where male chickens are not culled but raised for meat alongside female chickens, which are kept for egg production [15,16]. These findings suggest a general consumer preference for chicken originating from systems with improved animal welfare compared to conventional broiler husbandry. However, the final cost affects and limits the consumer’s preference [17]. Generally, consumers’ willingness to pay a higher price for chicken from farms with enhanced welfare conditions is complex and influenced by various factors, such as gender, age, education and income level [4,17]. Nevertheless, globally, this willingness is stronger when improved farming conditions provide birds with lower stocking densities, access to the outdoors and/or the ability to express natural behaviors [4,12].

In response to consumer concerns about the welfare of broilers and their complex willingness to pay, various types of husbandry systems have been developed to address the challenge of producing a product that is as sustainable as possible for the animals and the environment and yet affordable for the consumer. This challenge is also reflected in the labelling, since labelling has a crucial role in the final decision of the consumer by both providing information on the animal welfare level and farming practices and strengthening traceability and increasing consumer’s trust in the food production chain [4,14].

This review is an effort to identify the main animal welfare labelling schemes for broilers in Europe, developed by both private and public initiations at the national or international level. We will analyze the provisions that they include, which contribute

to enhanced animal welfare compared to conventional systems, along with the positive welfare indicators that they promote. Further to this, we will compare their geography, type of initiator, audit frequency and whether they assess welfare at a single or multiple levels. Additionally, we will examine whether these schemes assess animal welfare during transport and slaughter. Based on our overview, we will discuss the current implementations and make suggestions for future studies to overcome the existing challenges.

2. Materials and Methods

The focus of our research was to identify animal welfare standards and protocols for broilers, followed by visiting the official website of each scheme to study and analyze their standards and regulations. A labelling scheme was included in our review if it was used in the European market, regardless of whether it was developed in Europe. Schemes could have either national or international presence. The initiator could be private, public or a collaboration of both. In the case of private initiatives, the initiator could be any kind of commercial stakeholder or NGO. We also included protocols or standards developed with the involvement of universities.

We followed the PRISMA guidelines for systematic reviews. We present our search strategy, results and methodology in Figure 1. We began by selecting eight animal welfare labelling schemes that we were already familiar with and visited their official websites directly. Additional standards were identified through web searches using Google. A web-based search rather than scientific databases was chosen because animal welfare schemes are developed to address a broad audience, various stakeholders and citizens and not only the scientific community. The following keywords were used in various combinations: “animal welfare scheme*”, “animal welfare protocol”, “animal welfare standard*”, “animal welfare assessment”, “labelling”, “labeling”, “broilers”, “chicken*”, “chicken meat”, Europe, European*. We also used, as keywords, each European country separately. This process led to the identification of nine animal welfare labelling schemes. Thus, together with the schemes which we were already familiar with, our search process led to seventeen results.

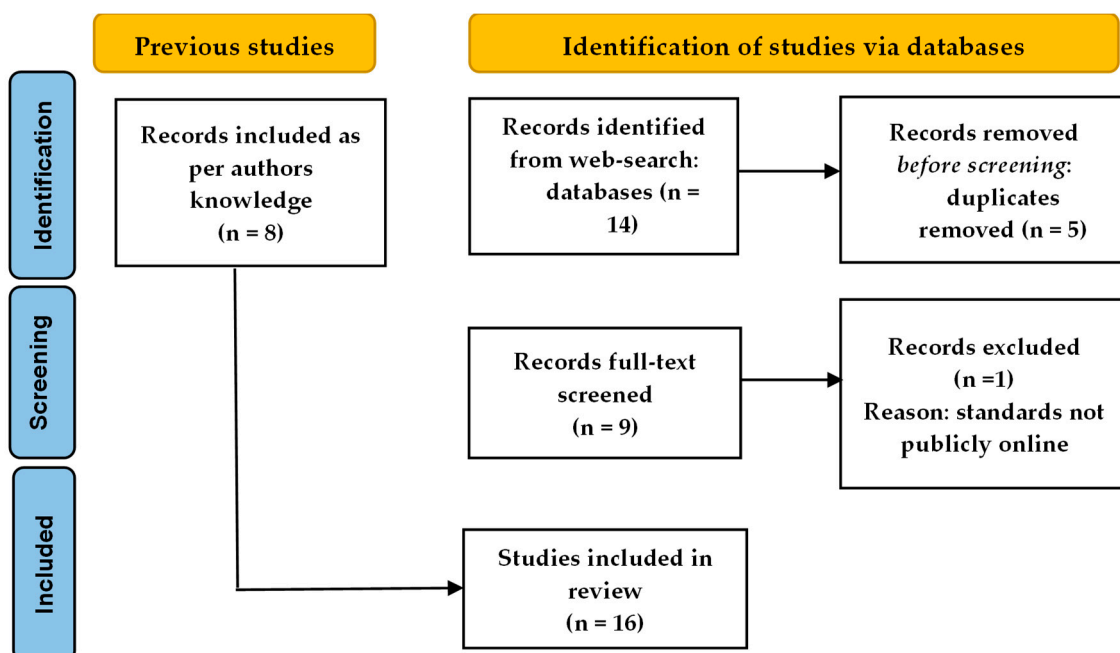


Figure 1. Flow chart presenting methodology, selection and data collection process.

After reviewing the official pages of each scheme, we found that sixteen made their standards publicly available, so they were incorporated into the review. The only one excluded was Für Mehr Tierschutz scheme because we could only access a limited selection of the standards, which did not include the animal welfare provisions and factors of the schemes that we aimed to analyze. The data collection process involved studying the certification process, structure, content and criteria incorporated in the schemes, as presented on the official websites, to extract the information that we wanted to analyze.

The date that each source was last searched or consulted is the date that each source was assessed on, in the reference list. Screening, record collection and then data extraction were performed by two reviewers. Initially, the reviewers first worked independently. In a second step, all data were summarized and analyzed by both reviewers collaboratively to avoid bias.

3. Results

Table 1 presents the most important animal welfare certification schemes for broilers, which are applied in the European market. The majority (12 schemes) have been developed at a national level, while only four resulted from international collaborations and are, thus, present in multiple countries [18–21]. These are mainly standards developed by non-governmental organisations (NGOs). Animal Welfare Approved by A Greener World (AGW) [22] was developed by the non-profit organization A Greener World, promoting agricultural practices beneficial both for the animals and the environment, and has a pan-European presence [23]. Better Chicken Commitment [21], created by the non-profit organization of the same name in cooperation with other NGOs and scientists from various countries, focuses exclusively on improving the welfare of broilers in the industry and is present globally [24]. Animal Welfare Certified by GAP (Global Animal Partnership) [19] was developed by an initiative of Global GAP and has the most widespread geographical extent of all the retrieved animal welfare labelling schemes for broilers. Global GAP is present in more than 130 countries, involves the collaboration of over 430 private entities, both profit and non-profit, and has developed various standards that promote sustainable practices, including broiler welfare [25]. Naturland is an international organic farming association based in Germany [26]. Its standard, of the same name, certifies organic farms with stricter standards than EU Regulation 2018/848. All the labelling schemes that we identified originate from Central and Northern European countries, with the only exception being the Welfair [27] standard, developed in Spain and used in both Spain and Portugal. Additional certification protocols have also been developed in Southern Europe, particularly in Italy and Spain; however, their scope is the welfare assessment of cattle, small ruminants, and laying hens and not broilers [7]. Certification schemes established at the national level are typically implemented within the country of origin and, to a lesser extent, in neighboring countries. A notable exception is the Swedish certification system KRAV, which, beyond its application in Scandinavia and the Baltic region, is also widespread in Spain, Bulgaria, and Germany. Established in 1985, KRAV is one of the oldest certification schemes. Its standards exceed those of EU Regulation 2018/848 concerning organic production [28]. As of 2021, KRAV represented the certification system with the largest number of certified companies on a global basis, involving approximately 6800 farmers, livestock producers, and stakeholders within the agricultural and food supply chain [7].

Table 1. All the identified animal welfare labelling schemes for broilers used in Europe, with information on number of levels, developing country, geographical scope, initiator, frequency of audits, type of husbandry system they refer to and whether they focus on sole animal welfare evaluation or take into consideration also other aspects of sustainable farming.

Labelling Standards	Tiers (Number)	Origin	Geographical Territory	Initiation	Audit Frequency	Exclusive Focus on Animal Welfare	Type of Husbandry Systems	References
KRAV	1	Sweden	national (but also in other European countries)	private	annual	no	extensive	[28]
Svensk Sigill	2-IP Sigill Grundcertifiering/klimatcertifiering	Sweden	national	private	annual	no	extensive	[29]
Bedre Dyrevelfaerd	3	Denmark	national (also Scandinavia, Baltic Area)	public-private	annual	yes	intensive-extensive	[30]
Anbefalet af Fyrenrs Beskyttelse	1	Denmark	national (also Scandinavia)	private	at least annual (different times over the year)	yes	extensive	[31]
Beter Leven	3	Nederland	national	public-private	annual	yes	extensive	[32,33]
Naturland	1	Germany	international (Europe)	private	at least annual	no	extensive	[18]
Demeter	1	Germany	national (also international)	private	annual	no	extensive	[22]
Bio Suisse	1	Switzerland	national (also international)	private	annual	no	extensive	[34]
Red Tractor Broilers (B)/Enhanced Welfare (EW). Free-range (FR)	1	UK	national	private	annual (max 18 months)	no	intensive	[35]

Table 1. Cont.

Labelling Standards	Tiers (Number)	Origin	Geographical Territory	Initiation	Audit Frequency	Exclusive Focus on Animal Welfare	Type of Husbandry Systems	References
RSPCA Assured	1	UK (RSPCA)	national (also Ireland, Australia)	private	annual	yes	semi-intensive-extensive	[36]
Label Rouge	1	France	national	public	at least annual	no	extensive	[37]
Étiquette Bien-être animal	4 (A–D)	France	national	private	annual	yes	intensive-extensive	[38]
Bienestar Animal-Welfair (Welfare assessment protocol for broilers)	1	Spain	national (also Spain, Portugal)	public (research institutes)	minimum annual	yes	intensive-extensive	[27]
Animal Welfare Certified by GAP	6 (1–5, 5+)	Global GAP	international	private	every 15 months (to cover all seasons)	yes	intensive-extensive	[19]
Animal Welfare Approved by AGW	1	A Greener World	international	private	minimum annual and in all farms	yes	extensive	[20]
Better Chicken Commitment	1	Compassion in World Farming	international	private	annual (max 15 months)	yes	intensive	[21]

Most labelling schemes have been developed through private initiatives; however, three of them are a result of private and public collaboration: Bedre Dyrevelfærd [30], Beter Leven [32,33] and Welfair [27]. Bedre Dyrevelfærd [30], developed in Denmark, is audited by private entities, but the certification is exclusively carried out by public authorities [30]. Today, Denmark is the only country in Europe that certifies animal welfare at the governmental level. Nevertheless, efforts are also currently exerted to develop animal welfare labelling schemes certified at a public level in Italy and Germany [7]. Beter Leven [32,33] and Welfair [27], developed in the Netherlands and Spain, respectively, as a result of public–private partnership. However, they are both inspected and certified by private entities. The framework of Welfair is based on the Welfare Quality Assessment Protocol for Poultry [27], which is the result of research and collaboration within the Welfare Quality Network, a network of various European universities. While the network itself does not operate a labelling scheme, it develops animal welfare protocols that may serve as guidance for the creation of animal welfare labelling schemes by public and private entities on a national level [39].

Many labelling systems have been developed through the initiative of non-profit organizations. Examples include Anbefalet af Dyrenes Beskyttelse [31], found primarily in Denmark, as well as Better Chicken Commitment [21] and Animal Welfare Certified by GAP [19], recognized internationally. Another example is Royal Society for the Prevention of Cruelty to Animals (RSPCA) Assured [36], used in England and Ireland and created by the NGO of the same name, one of the oldest organizations advocating animal welfare in the world [40]. The Bien-être Animal labelling standard [38] is a result of collaboration among not only non-profit organizations but also stakeholders. The Label Rouge labelling scheme [37] is the world's first and oldest labelling scheme for broilers, established in 1965. It was initiated by a group of French farmers seeking to differentiate their chicken from that produced in intensive farming systems. Originally based on private criteria, the standard aimed at producing high-quality meat, but over time, it evolved and included requirements that improve the animal welfare level of broilers [7].

Regarding the number of tiers, the standards may follow either a single- or multi-level approach. In most cases, certification operates on a binary basis, meaning that a farm either passes or fails the certification audit. However, five employ a multi-tiered certification process, using up to six levels in Animal Welfare Certified by GAP [19]. The different tiers are often indicated on the label using specific symbols. For example, Bedre Dyrevelfærd [30] uses heart, while Beter Leven [32,33] stars. Étiquette Bien-être Animal [38] applies a scale from A to D, while Animal Welfare Certified by GAP is using a 1–5 scale, with an additional 5+ tier representing the highest level of welfare [19].

As indicated in Table 1, most standards focus exclusively on the welfare of broilers without promoting any other key parts of sustainability. Still, some adopt a more holistic approach to sustainability by incorporating environmental criteria. An example is the Demeter standard [22], which certifies biodynamic livestock systems. Some schemes go even further by including additional criteria regarding social responsibility [22,29]. Regarding the type of production systems, most systems have been developed for extensive systems, since enhanced animal welfare for broilers, particularly during the early stages of life when the birds are more active and lighter, is linked to access to the outdoors [40]. Nonetheless, Red Tractor Broilers and Enhanced Welfare [35], Better Chicken Commitment [21], the two lowest tiers of Étiquette Bien-être animal [38] and Animal Welfare Certified by GAP [19], have been developed for the assessment of animal welfare of broilers in intensive systems. Red Tractor Enhanced Welfare [35] has incorporated all the criteria imposed by the Better Chicken Commitment [21]. Bedre Dyrevelfærd [30] and Welfair [27] can be used in both intensive and extensive systems.

As shown in Table 2, all labelling schemes require the use of slow-growing breeds and, in general, breeds suitable for organic production, while only few accept all breeds. One notable example is Svensk Sigill [29], which, despite mentioning that all breeds are allowed, emphasizes the welfare and health of each individual bird and that management practices are accordingly adapted. Animal Welfare Approved by AGW [20] accepts all breeds but recommends the use of traditional ones and the rearing of male chicks from dual-purpose breeds, where females are used for egg production and males for meat. Animal Welfare Certified by GAP [19] permits the use of fast-growing breeds at the lower certification levels, where birds have limited access to outdoor areas. However, at the two highest levels, which require daily access to pasture, the use of slow-growing hybrids is mandatory. In most cases, the birds should have passed all their lives under the required conditions of the standard to be certified. The sole exception is Bio Suisse [34], requiring only 56 days as conversion period for poultry that have entered the farm before the age of three days to transit from uncertified to certified status.

Table 2. Labelling standards for broilers with information on required breeds and conversion period, maximum allowed stocking density and flock mortality. The table summarizes also key aspects of the required lightning program.

Labelling Standards	Breed	Conversion Period	Beak Trimming Allowed	Stocking Density	Flock Mortality	Light Intensity	Continuous Darkness (Minimum)	References
KRAV	suitable for organic farming	10 weeks	no	Indoors: 20 kg/m ² , outdoors: 4 m ² /bird	Not specified	daylight must be let in via an area equivalent to at least 3% of the floor area	8 h	[28]
Svensk Sigill	all	all life	Not specified	max 20 kg/m ²	Not specified	flicker-free lightning or with of at least 120 Hz flicker frequency	Min 6 h of which min 4 h continuous.	[29]
Bedre Dyrevelfaerd	slow growing	No	Not specified	I: 38 kg/m ² , II: 32 kg/m ² , III: 27.5 kg/m ² indoors, min 1 m ² /bird outdoors	max 1% plus 0.06% multiplied by the age of the flock at slaughter in days	Not specified	Not specified	[30]
Anbefalet af Fyrenns Beskyttelse	Slow growing (average gain 38 g/day)	All life	no	Indoors 30 kg/m ² , outdoors 1 m ² /bird	Not specified	lighting program that ensures a normal circadian rhythm	8 h	[31]
Beter Leven	slow growing	All life	Not specified	I: 12 birds/m ² – 25 kg/m ² , III: 11 broilers/m ²	Not specified	Min 20 lux, daylight-permeable surface min 3% of the ground surface	8 h	[32,33]
Naturland	suitable for organic farming	10 weeks; small poultry 6 weeks	no	Pasture: 480 birds per hectare, indoors: max 21 kg live weight/m ² , outdoors: 4 broilers/m ²	Not specified	Natural light, not specified	8 h	[18]
Demeter	all	All life (half if organic)	no	1 m ² /kg live weight	Not specified	Not specified	8 h	[22]
Bio Suisse	dual-purpose chickens, parent chicks may be of non-organic provenance.	56 days for poultry entered before 3 days of age	no	15 pullets/m ² 1–42 days, 8 birds/m ² > 42 days	Not specified	Natural light	8 h	[34]

Table 2. Cont.

Labelling Standards	Breed	Conversion Period	Beak Trimming Allowed	Stocking Density	Flock Mortality	Light Intensity	Continuous Darkness (Minimum)	References
Red Tractor Broilers (B)/Enhanced Welfare (EW). Free-range (FR)	B, FR, EW: Hubbard: JA757, JA787, JA957, JA987, Redbro (indoor use only), Norfolk Black, JACY57-Aviagen: Rambler Ranger, Ranger Classic, Ranger Gold	B, FR, EW: no	B, FR, EW: no	B: Max 38 kg/m ² , EW: 30 kg/m ² , FR: 27.5 kg/m ²	B, FR, EW: Max 5%	B, FR: 20 lux measured at bird eye level and recorded once every crop illuminating at least 80% of the usable bird area, during lighting periods, EW: Lighting intensity min 50 lux-natural daylight through windows (min of 3% of the floor area)	B, EW: Min 6 h of which min 4 h continuous, FR: min 6 h	[35]
RSPCA Assured	Hubbard: JA747, JA957, Norfolk Black, JACY57-Aviagen: Ranger Gold, Rambler Ranger (indoor and free-range) (JA787, JA987, Redbro, Ranger Classic, Rustic Gold: under derogation) [41]	All life	no	Indoors: 19 birds/m ² –30 kg/m ² , free-range: 13 birds/m ² –27 kg/m ²	Not specified	Natural light no later than 7 days of age, prior min 20 lux, min 8 h continuous light/day	min 6 h and max 12 h continuous darkness,	[36]
Label Rouge	slow-growing specific breeds (separate section)	All life	Not mentioned	Indoors: 20 birds/m ² (40 kg/m ²), outdoors: 2 m ² /bird	Not specified	Not specified	Not specified	[37]
Étiquette Bien-être animal	all	All life	Not mentioned	D: max 38 kg/m ² , C: 30 kg/m ² , B: 27.5 kg/m ² , A: 25 kg/m ² , outdoors A 1 m ² /bird, B 2 m ² /bird	Not specified	Permeable area of natural light 3% of surface A, B, C, less D	6 h A, B, C and 4 h D	[38]
Bienestar Animal -Welfare (Welfare assessment protocol for broilers)	slow growing	Not specified	Yes (beak trimming criterion)	Not specified	Not specified but on farm mortality criterion	Not specified	Not specified	[27]
Animal Welfare Certified by GAP	all tiers 1–3, slow growing 4–5+ (From 1 June 2030, breeds that are able to perch throughout their lives for all tiers)	All life	no	6 lbs/ft ² (29 kg/m ²) tiers 1–3, 5.5 lbs/ft ² (27 kg/m ²) tiers 4–5+	6% tier 1, 5% tiers 2, 3, 4% 4–5+	Light intensity in housing 50 lux during over 80% of the floor space is used by the birds	6 h tiers 1, 2, 8 h tiers 3, 4 by 3 days of age, 8 h tiers, 5, 5+ from start	[19]
Animal Welfare Approved by AGW	recommended traditional breed and dual-purpose breeds	All life, or placed max at 36 h age	no	Indoors: 0.06 sq meters/bird and extra 0.18 sq meters/bird when excluded from foraging	Not specified	Min 20 lux	8 h	[20]
Better Chicken Commitment	breeds that demonstrate high welfare outcome (slow growing)-also approved by RSPCA	All life	no	Max 30 kg/m ²	Not specified	Min 50 lux	6 h continuous	[21]

Almost all identified animal welfare standards require lower stocking density compared to the one in conventional farming systems (33 kg/m² for indoor areas as set by Directive 2007/43/EC, increased to 42 kg/m² if certain criteria are met). Some establish even stricter criteria than the one in organic farming (21 kg live weight/m² indoors or 580 chickens/hectare, provided that the nitrogen limit of 170 kg is respected, as set by Regulation 2018/848). Three standards establish a threshold for flock mortality [19,30,35], ranging from 1% plus 0.06% multiplied by the age of the flock at slaughter in days in all

tiers of Bedre Dyrevelfærd [30] up to 6% in the lowest tier of Global GAP [19]. Another factor affecting the welfare of broilers and described with details in almost all standards is the required lightning program, including criteria for minimum light intensity and continuous darkness. As indicated with details in Table 2, light intensity must be minimum 20 [32,33,35] to maximum 50 [19,21] lux. The permissible area of natural light is also specified, usually established at being equivalent to at least 3% of the floor area [28,32,33]. The required minimum period of continuous darkness varies between 6 h, of which a minimum of 4 h is continuous [29,35] (as set also by Directive 2007/43/EC for conventional husbandry systems) and 8 continuous hours of darkness [18,19,27,29–34].

Table 3 summarizes the environmental enrichment and the positive welfare indicators that are promoted in the selected schemes for broilers to improve the birds' welfare. Perching is an intrinsic behavior of broilers, strongly motivated, that promotes safety and, thus, positive emotional states [42–44]. It is either not specified in the standards or set at a 5 cm perch or 25 cm² elevated [22,38] area per bird [18,28,31]. Still, some standards describe with detail the form of the elevated areas (platforms usually) and the height that they should have from the ground so that they can be used by the birds [27,36]. RSPCA Assured also has a separate manual that explains each environmental enrichment required by the standards and the benefits that these give to the wellbeing of the birds, serving as guidance [45]. Access to pasture/the outdoors is set as criterion in almost all animal welfare standards for broilers, except those developed for intensive systems [21,30]. The maximum age until which the birds have access outdoors and the least number of hours per day are also often established [20,21,30–32]. Additionally, detailed requirements are set for the vegetation of the outdoor areas, including both the percentage and type of plant coverage. For example, Animal Welfare Certified by GAP [19] requires vegetation coverage ranging from 10% to 68% depending on the certification level. Furthermore, environmental enrichment that promotes the expression of a wide range of positive welfare indicators is often necessary, including sandbathes and various types of pecking objects. Chickens must be able to express exploration by scratching the ground in search of insects [31,42–44], and the soil should be enriched with seeds to encourage foraging [22,42]. All areas must be designed to promote comfort behaviors [42,44] such as stretching [28] and enriched with various pecking objects like straw bales that can also serve as areas of seclusion [29,35], promoting safety [42,46,47]. The Welfair [27] labelling system goes even further by assessing the positive emotional status of the birds via a Qualitative Behavioral Assessment (QBA) and the positive human–animal interaction through an avoidance distance test. The QBA has been studied for the assessment of both positive and negative emotions in broilers, and, together with other indicators, it is a promising tool to evaluate positive welfare, although more research is needed [42,48,49], while a positive human–animal relationship is already a valid positive welfare indicator [43,50–52]. Further to this, almost all schemes promote behavioral synchronization through spatial enrichment and/or giving more space, promoting cohesion and safety in group-housed birds and so positive emotional states [44,53–55]. Finally, environmental enrichment promotes behaviors associated with play [42,44,53].

Table 3. Types of environmental enrichment and positive welfare indicators promoted in the identified animal welfare standards for broilers.

Labelling Standards	Perches	Access to Pasture/Outdoors	Vegetation/Foraging Materials	Specific Other Environmental Enrichment	Positive Welfare Indicators	References
KRAV	At least 5 cm or at 25 cm ² raised sitting area or all combinations of these	As much as possible, min 4 months, 12 h/day	adequate number of trees, bushes etc where birds can seek shelter and security	sand baths in a number so that all birds can use them freely both indoors and on the perches and raised seats indoors	Exploration, behavioral synchronization, comfort, areas of seclusion, perching	[28]
Svensk Sigill	min 150 mm/bird	Free access outdoors (veranda or conservatory)	Not specified	min 1 bale straw/hay per 100 m ² , each weighing at least 10 kg, elevated platforms with a surface area of min 0.36 m ² per 100 m ² and min height 20 cm, placed when birds 7–12 days age	Exploration, behavioral synchronization, comfort, perching, play	[29]
Bedre Dyrevelfaerd	not specified	I:no, II: yes and at last 12 days of life all day	II: outdoors space min 15% indoors, III: min 25% covered with vegetation, min 18% planted with shrubs and/or trees, min 7% ground cover	II, III: roughage and enrichment in general	II, III: exploration, perching, seclusion areas, behavioral synchronization	[30]
Anbefalet af Fyrenrs Beskyttelse	At least 5 cm or at 25 cm ² raised sitting area or all combinations of these	Since birds are fully feathered, but no later than 6–7 weeks of age in the summer period and no later than 9 weeks of age in the winter period (1 October–15 April)	Grass and vegetation for protection and shelter (straw bales and windbreaks if needed)	raised platforms (resting areas) and/or straw bales since birds are 2 weeks old.	Exploration, behavioral synchronization, comfort, areas of seclusion, perching, play	[31]

Table 3. Cont.

Labelling Standards	Perches	Access to Pasture/Outdoors	Vegetation/Foraging Materials	Specific Other Environmental Enrichment	Positive Welfare Indicators	References
Beter Leven	Not specified	The broilers have access to the covered run from the age of 21 days, min 8 h/day	covered run has an area of min 20% of the total area of the barn.	From 15 days age, min 2 g of grain/feed per broiler per day is provided as enrichment material, from 8 days age, a min 1 straw, hay, or lucerne bale of 15–20 kg per 1000 broilers is provided in the barn/Usable floor surface area covered entirely by loose, white wood chippings, wood shavings, loose straw, loose chopped straw	Exploration, behavioral synchronization, comfort, areas of seclusion, play	[32,33]
Naturland	5 or 25 cm ² raised sitting level/bird	Always outdoor access, foraging when weather allows (veranda obligatory, conservatory if more than 200 poultry)	trees, bushes, suitable outdoors	Sand- and dustbath in conservatory, appropriate litter over at least 33% of the base run	Exploration, foraging, behavioral synchronization, comfort, areas of seclusion, perching	[18]
Demeter	elevated resting places must be provided	Yes, pasture/veranda	min 40% of the area evenly covered with perennial crops to provide protection, e.g., bushes and trees.	Sandbathes mandatory	Exploration, comfort, areas of seclusion, behavioral synchronization	[22]

Table 3. Cont.

Labelling Standards	Perches	Access to Pasture/Outdoors	Vegetation/Foraging Materials	Specific Other Environmental Enrichment	Positive Welfare Indicators	References
Bio Suisse	8 cm/bird 1–42 days. 14 cm/bird > 42 days	Yes, outdoors no later than 43 days of age, Cockerels and dual-purpose chickens access to pasture min 50% of their life, structure must offer min 2 m ² shade	structural elements e.g., bushes, trees, protective netting and shelters that provide shade and protection	Dustbath 150 birds/m ² and at least 5 cm depth when birds > 42 days/appropriate bedding	Exploration, comfort, areas of seclusion, behavioral synchronization, play	[34]
Red Tractor Broilers (B)/Enhanced Welfare (EW). Free-range (FR)	B, FR, EW: Min 2 linear m perch or 0.3 m ² /1000 birds. B: Max 15 cm off the ground, FR, EW: max 10 cm off the ground	B, FR: access to the range for at least half their lives, min 8 h/day	B, FR, EW: Not applicable	B, FR, EW: clean, fresh bedding with min depth 2 cm, min 1 bale/1000 birds by day 3, min 1 pecking object/1000 birds	B, FR, EW: Exploration, comfort, perching, play	[35]
RSPCA Assured	2 m perch/1000 birds	access to the range min half their lifetime and, no later than 28 days of age for free-range labelling, no later than 35 days of age to be labelled organic	mainly covered by living vegetation, shade and shelter min 8 m ² /1000 birds	litter average min depth 5 cm and must allow birds to dustbath, wood shavings the perfect, 1.5 standard sized, long chopped straw bales and one pecking object/1000 birds	Exploration, comfort, areas of seclusion, behavioral synchronization, play, perching	[36]
Label Rouge	Not specified	Access to pasture max at 6 weeks of age	Covered mostly with vegetation e.g., trees, hedges, groves, min 20 trees or shrubs	Dry, soft litter to ensure comfort	Exploration, comfort, areas of seclusion, behavioral synchronization	[37]
Étiquette Bien-être animal	Yes, not specified, in all tiers	Access outdoors A, B: min half-life 8 h/day	High vegetation in A, not specified	Pecking objects in all tiers	Exploration, perching, play	[38]

Table 3. Cont.

Labelling Standards	Perches	Access to Pasture/Outdoors	Vegetation/Foraging Materials	Specific Other Environmental Enrichment	Positive Welfare Indicators	References
Bienestar Animal -Welfair(Welfare assessment protocol for broilers)	Not specified	Not mandatory, for free range/extensive systems free range criterion: proportion of birds using the range	Cover on the range criterion: vegetation which the birds can use for cover or manmade shelters	Plumage cleanness, litter quality criteria	Exploration, comfort, behavioral synchronization, play, positive emotions (QBA), human-animal relationship (avoidance test in farms, Flapping on the line in slaughterhouses)	[27]
Animal Welfare Certified by GAP	Starting 1/6/2030-perches must be provided min 80 in (200 cm)/1000 birds tiers 1, 2, starting 1/6/2027 tier 3, 1/6/2025 tiers, 4, 5, already tier 5+	Tiers 1, 2: access outdoors not required, tier 3: min 2 weeks by 28 days age, tiers 4–5+ from 28 days everyday access outdoors	Pasture raised labelling requires not less than 51% rooted vegetative cover, up to 75% covered at tier 5+, occupied outdoor areas must contain features that encourage foraging	All: litter of quality/quantity to provide comfort and allow for dust-bathing and foraging/scratching, min 7.5 cm, tier 1: 1 enrichment/1000 birds, tiers 2–4, 2 different enrichments/1000 birds	Exploration, comfort, behavioral synchronization, play, perching, seclusion areas	[19]
Animal Welfare Approved by AGW	Access to elevated areas from 4 weeks of age, 1 inch/bird perch or 1 inch ² /bird straw bale (min 5, 5 inches height)	Access to forage by 7 days of age but recommended by 24 h age, min 50% of daytime	access to growing green vegetation	All must have access to dustbaths	Exploration, comfort, behavioral synchronization, play, perching, seclusion areas	[20]
Better Chicken Commitment	2 m/1000 birds	Developed also for intensive systems	Not specified	2 pecking substrates/bird	Exploration, comfort, perching	[21]

Although all standards provide detailed requirements concerning the rearing period of broilers, as shown in Table 4, transport and slaughter are not extensively analyzed. According to EU Regulation 1/2005, the maximum permitted transport time for broilers is eight hours. Most certification schemes impose stricter limitations, while Animal Welfare Certified by GAP [19] at level E+ requires on-farm slaughter. The minimum slaughter age is determined by the type of breeds allowed by each standard, reaching up to 81 days for some standards that require slow-growing breeds, the same age as in organic farming [18,28,38]. Regarding permitted stunning methods, electrical stunning is prohibited according to Anbefalet af Fyrenrs Beskyttelse [31] and Beter Leven standards [56], with controlled atmosphere stunning being the only permitted method. Similarly, Animal Welfare Approved by AGW [57] recommends that electrical stunning should not be used.

Table 4. Maximum transport time and stocking density, allowed stunning methods, and minimum slaughter age of broilers according to each standard. The table also shows if each scheme includes a separate section which focuses solely on transport/slaughter. If the indication is no, this means that only the minimum requirements apply, as set by EU Regulations 1/2005 and 1099/2009 on transport and slaughter, respectively.

Labelling Standard	Separate Section		Maximum Transport Time	Maximum Stocking Density in Delivery Box	Stunning Methods	Minimum Slaughter Age (days)	References
	Transport	Slaughter					
KRAV	no	No	Best minimum, not specified	Not specified	Not specified	81 no slow, 10 weeks slow growing	[28]
Svensk Sigill	yes	Yes	8 h	weight < 1.6 kg 180–200 cm ² /kg, 1.6 to < 3 kg 160 cm ² /kg, 3 till < 5 115 cm ² /kg, >5 kg 105 cm ² /kg	blow to the head, electricity, carbon dioxide	Not specified	[58]
Bedre Dyrevelfaerd	no	No	6 h	Not specified	Not specified	Not specified	[30]
Anbefalet af Fyrenrs Beskyttelse	yes	Yes	8 h	Not specified	Gas stunning	Not specified	[31]
Beter Leven	yes	Yes (separate standard)	4 h	Not specified	Controlled Atmosphere Stunning	I: 56, III: 81 days	[56]
Naturland	yes	No	8 h	Not specified	Not specified	81	[18]
Demeter	no	No	Minimized, on farm slaughter recommended	Not specified	Not specified	81	[22]
Bio Suisse	no	No	8 h	Not specified	Not specified	Not specified	[34]
Red Tractor Broilers (B)/ Enhanced Welfare (EW). Free-range (FR)	Yes (separate standard)	Yes (separate standard)	8 h	poultry > 1.6 kg: 180–200 cm ² /kg–1.6 kg–3 kg: 160 cm ² /kg, 3 kg–5 kg–115 cm ² /kg	controlled atmosphere stunning using inert gas or multi-phase systems, electrical stunning only permitted without live inversion	Not specified	[58,59]
RSPCA Assured	yes	Yes	4 h	57 kg of birds/m ² of tray floor area	Controlled atmosphere stunning and electrical stunning allowed, but the second not recommended	Not specified	[36]
Label Rouge	no	Yes	3 h	Not specified	Not specified	81 days	[37]
Étiquette Bien-être animal	yes	Yes	4 tier A, 6 tier B, 8 tiers C, D, E	Not specified (but mortality specified)	Controlled atmosphere stunning and electrical stunning allowed	81 days A, 56 days B, C, D not specified	[38]
Bienestar Animal -Welfare (Welfare assessment protocol for broilers)	no	No	Not mentioned	Not specified but stocking density in crates criterion	Not specified	Not specified	[27]
Animal Welfare Certified by GAP	yes	yes	6 h (tier 5+ on-farm slaughter)	Max 4 in ² (26 cm ²)	controlled atmospheric stunning using inert gas or multi-phase systems	Not specified	[19]

Table 4. Cont.

Labelling Standard	Separate Section		Maximum Transport Time	Maximum Stocking Density in Delivery Box	Stunning Methods	Minimum Slaughter Age (days)	References
	Transport	Slaughter					
Animal Welfare Approved by AGW	yes	Yes (separate standard)	4 h	Max 7 lbs (3 kg) per cubic foot (0.028 cubic meters) in crates	Penetrating /non-penetrating captive bolt, electric stunning via handheld devices/dry plate, controlled atmosphere stunning, controlled atmosphere killing	Not specified	[57]
Better Chicken Commitment	yes	yes	8 h	Not specified	atmospheric stunning using inert gas or multi-phase systems, or electrical stunning without live inversion	Not specified	[21]

4. Discussion

Labelling schemes with improved animal welfare standards for broilers are being developed continuously in Europe, due to the increasing interest of consumers in animal welfare of production species and the applicable farming practices [2–6]. Their standards vary and differ significantly since they have been developed for animal welfare assessment in various types of systems. Another factor that contributes to this heterogeneity is the country of origin, since countries are allowed to impose stricter standards at a national level than those of conventional and organic farming, a legislative approach to animal welfare common in Northern European countries [7]. Additionally, the income, the culture and the educational level differ between countries and so consumers' willingness to pay a premium price for animal-derived products for husbandry systems of a higher welfare level [5,6,12–17]. As a result, there is a significant number of animal welfare labelling schemes for broiler and heterogeneity in the included standards, making their comparison difficult. To avoid consumer confusion, an approach could be the development of a pan-European labelling system with countries adopting a unified policy [12]. This direction is supported primarily by NGOs [7]. Nonetheless, in practice, it could create problems since not all European countries would be able to follow the common animal welfare standards and produce animal-derived products, which could remain economically viable and competitive in the unified European market [7]. Furthermore, the existence of various schemes also means the existence of various, significantly different rearing practices, from extensive to intensive, which, in turn, lead to chicken meat in a wide cost range, which can appeal to a broader segment of the consumer market.

Labelling schemes that have been created for the evaluation of animal welfare in intensive or semi-intensive systems are based on the conventional regulation. Still, they go beyond it by specifying and describing in detail all the requirements, something not that common in European regulations. For example, environmental, species-specific enrichment is a legislative general demand according to conventional regulations. All animal welfare schemes not only demand enrichment but also set standards on the type of enrichment, the number of enrichments, even the maximum age of broilers by which these enrichments should be provided to the birds. For example, Animal Welfare Certified by GAP [19] requires two enrichments per 1000 birds, provided by the time birds are 10 days old and throughout their lives, including an annex, which describes in detail the different types of enrichment that can be used. Red Tractor [35] specifies that the bedding of birds must be clean, fresh, with at least 2 cm depth and that, by day 3, all chickens should be provided with a minimum of one bale of straw per 1000 birds. Thus, although some schemes evaluate welfare in intensive systems and do not require outdoor access, they improve the level of animal welfare by setting strict standards on management and animal handling

practices. As shown in Table 2, this also applies to the lightning program. *Étiquette Bien-être animal* [38] in levels A and B, although requiring at least 6 h, including a minimum 4 h of continuous darkness, as in conventional, intensive husbandry systems, additionally demands the permeable area of natural light to be at least 3% of the total surface. RSPCA Assured [36] imposes a minimum of 6 h continuous darkness.

The same approach of describing in detail most provisions, especially those regarding environmental enrichment, is also common in the labelling schemes that evaluate the welfare of broilers in extensive systems [19,20,26,30,33–36]. These schemes describe, additionally with details, not only the minimum requirement of access to pasture/the outdoors but also the vegetational cover. Vegetation can create a complex environment of structural and sensory enrichment, which can promote various positive welfare indicators like exploration, foraging, behavioral synchronization and places for seclusion where animals can feel safe [42,44,53]. Moreover, some standards also focus on establishing the correct height of resting areas/platforms for the birds [20,37], a factor important for broilers since their body weight increases faster than laying hens and makes it difficult for them to perch/roost [43]. For example, Red Tractor [35] requires the resting areas to be a maximum of 15 cm off the ground in the Broilers and Enhanced Welfare standard and 10 cm in the free-range standard.

Thus, all standards establish a higher animal welfare level compared to those set by the conventional regulations, while those developed by NGOs advocating animal welfare impose even higher standards than the ones imposed by organic legislation [19,31,32]. RSPCA Assured [45] and Better Chicken Commitment [60] have, in addition to the standards, a manual with guidelines on the animal welfare of broilers, explaining in detail each animal welfare provision required by the standards. We propose that this would be beneficial for all schemes, as would providing the policy and standards available publicly online to increase consumer trust and, thus, willingness to pay.

The present literature review also shows that animal welfare evaluations of transport and slaughter for broilers are limited. As far as the authors are concerned, only three labelling schemes have developed a separate standard for slaughter [56,59,61] and only one for transport [58]. Various schemes include a separate section for transport and/or slaughter but impose a limited number of standards [30,31,37] focusing mainly on maximum transport time and allowed stunning methods. For a comprehensive assessment of broiler welfare, we need to evaluate not only the rearing phase of the birds but also the phases of transport and slaughter, which are really stressful and include handling practices that impose significant risks to welfare. This is important for all animals but significantly for small birds like broilers, since they are transported in crates, in high stocking densities, and the handling can be abrupt and difficult.

In addition, although the number of standards and protocols for the evaluation of welfare for broilers is increasing in Europe, the welfare assessment of broiler breeders remains neglected. To the best of the authors' knowledge, Red Tractor is the only labelling scheme with separate, distinct requirements for breeder layers and breeder replacements. Broiler parent stock suffers from severe welfare concerns, such as chronic feed restriction resulting in chronic stress and frustration, beak trimming, toe clipping and over-mating [62,63].

Gentle and calm handling of broilers is mentioned in general in all labelling schemes, for all production stages, but it should also be specified and set in a stricter frame like the other positive welfare indicators. A notable example is Animal Welfare Approved by AW [20] that specifies the management of chicks, mentioning, among others, for example, that birds must be placed from a height of 12 in (30 cm) or less. A positive human–animal relationship should be promoted due to its positive effect both on the wellbeing of birds and productivity [42,50–52,64]. It could be measured and incorporated using a simple, fast

and feasible human-approach test, as proposed in the Welfare Quality assessment protocol for poultry [27].

We also conclude that many labelling systems, such as the Beter Leven and Bedre Dyrevelfærd, focus solely on improving the level of animal welfare without taking into consideration any other sustainability factors. Therefore, their requirements are higher than those of conventional but lower than those of organic legislation. Since the emphasis is exclusively on welfare, it is easier for a producer to adjust the farming practices according to the standards and achieve them to become certified, compared to the modifications that would be required for an organic farming system. As a result, a farm can improve the welfare of the animals at a lower cost compared to converting its practices according to the requirements of organic farming [6]. Furthermore, economic and marketing studies can persuade producers in this direction, since an animal welfare chicken product can be a way for the producer to differentiate and become competitive in the market. Further research can provide evidence regarding the quality of meat, as already carried out for chickens raised under the Label Rouge [65] and those from dual production systems [66,67].

As discussed above, implementing a pan-European labelling system remains challenging to apply, at least at this stage, due to economic and regulative differences among EU Member States. Thus, the increasing number of labelling schemes and the heterogeneity of their included criteria contribute to uncertainty and reduced clarity for the consumer. In other words, a critical question remains: how can the end consumer access information related to animal welfare through chicken labelling, given the significant heterogeneity in standards across the schemes? This is a key challenge that must be addressed, to strengthen consumer confidence to choose and willingness to pay a premium for chicken from farms with higher animal welfare. As a first step, it is important to clearly communicate to consumers the criteria included in the schemes for broilers and explain, in an understandable way, how they contribute to a better welfare outcome. Effective marketing and promotion of the labelled products are crucial, as is the collaboration of all involved stakeholders. Moreover, transparency can be strengthened by ensuring that certification requirements are publicly available online. However, this alone is not enough. Consumers must be educated on animal welfare issues by both private and public stakeholders, as well as by the scientific community. Comparability among the standards across schemes is fundamental for an informed consumer choice.

Furthermore, in addition to comparability, critical thinking is necessary, as important welfare issues may persist, even in systems with improved animal welfare provisions. Consumers should be both informed about the criteria and educated about animal welfare, without being misled. A notable example is organic farming systems. Although slow-growing breeds are usually raised, birds may still experience growth-related and musculoskeletal problems, limiting their ability to adapt to outdoor environments as they grow older and heavier [68,69]. Moreover, birds can suffer from exposure to predators and extreme weather conditions, while the risk of parasitic infestation can be high if the management is inadequate [68–70]. These welfare issues should be communicated to consumers, enabling them to decide the husbandry system they want to support. Given that management at the individual farm level is crucial for welfare issues and outcomes, consumers should have trust in the integrity, frequency, and stringency of audits conducted to ensure compliance with scheme criteria. Trust can be further increased if various stakeholders are involved, including public and private actors, commercial entities and NGOs, working together and ensuring integrity. Additionally, the activities of inspection bodies must be controlled and sanctioned by public authorities, ensuring transparency and impartiality, as required by Regulation (EU) 2017/625 on official controls and other official activities performed to ensure the application of rules on animal health and welfare. Moreover,

the involvement of public authorities in the development of standards, monitoring and certification decisions can strengthen trust in labelling even more.

Finally, chicken meat is imported to the EU from non-EU countries, primarily Brazil. Imported poultry meat must comply with the marketing standards of the EU, as implemented by Commission Regulation (EC) No 543/2008, which does not include requirements on animal welfare. However, animal welfare requirements in non-EU countries are often not fully aligned with EU legislation. Currently, the focus of import regulation remains largely on animal health and food safety, not including welfare standards. Enforcing stricter requirements for animal welfare in imported chicken meat could help reduce consumer confusion and promote more informed choices.

Collaboration between the private and public sectors can result in gradual changes. In Netherlands, the consumption of meat labelled according to animal welfare schemes has been increased because of stricter legislation regarding animal welfare practices, consumer education on animal welfare and collaboration for animal welfare assessment between public and private entities, both profit and non-profit [71]. This multidimensional approach could result in increased demand for chicken raised under improved welfare standards, both by consumer selection and legislative pressure, and in increased willingness to pay. Chicken as a product will become economically sustainable, and the animal welfare level of broilers will be significantly enhanced.

5. Conclusions

In Europe, animal welfare is gaining increasing attention at both the public and scientific levels. This is also reflected in the growing demand for animal-derived products that originate from husbandry systems with improved animal welfare conditions. Thus, various labelling schemes are being developed, focusing on assessing animal welfare in various husbandry systems, ranging from fully intensive to fully extensive. Although there is heterogeneity in the animal welfare provisions that they require and the animal welfare indications that they promote, they all set stricter standards compared to conventional systems, and some are even higher than organic farming systems. They specify in detail the animal welfare provisions, leaving no place for misinterpretations and establishing a clear framework. While some schemes set baseline requirements similar to those of conventional legislation, they nonetheless elevate the overall level of animal welfare by articulating these standards with greater clarity and specificity. As a result, the animal welfare level is improved to some extent, even for intensive systems. The labelling schemes that have been developed by NGOs usually set the bar significantly higher, incorporating various positive welfare indicators that promote emotional states to broilers. However, the welfare of animals during transport and slaughter is often insufficiently addressed.

A variety of labelling is necessary for a final product with a wide range of prices, affordable in its turn to a wide range of consumers' incomes. The question is how much a consumer can afford and how much they are willing to pay. Nonetheless, the increasing number of animal welfare labelling schemes for broilers demonstrates that the consumer will pay a premium for animal welfare. Moreover, the fact that animal welfare is evaluated today at the public level shows that legislation is also laying down stricter standards on animal welfare. A key remaining challenge is to effectively inform consumers about the animal welfare criteria included in labelling schemes, since the significant heterogeneity of the criteria can cause confusion. Enhancing consumer education, promoting critical thinking, and improving the comparability of schemes are essential steps. Transparency in the development and implementation of standards, inclusion of diverse stakeholders and involvement of public authorities in the supervision of certification bodies and the

monitoring of animal welfare at the national level can all contribute to increasing consumer trust in animal welfare labelling.

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