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**ADVANTAGES AND CHALLENGES OF A VALUATION SYSTEM
OF STANDARDS IN THE FIELD OF EGGS**

THESES OF THE DISSERTATION

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Advantages and challenges of an assessment system of standards in the field of eggs

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1. Introduction

Food safety is a central issue in the food industry. It is about the production of healthy products that meet the demands of quality-oriented consumers. These are not only standards within the process chain, but also how the production was carried out transparently and comprehensibly at each stage. Furthermore, questions such as sustainability, resources or environmental criteria, CO₂ or carbon footprint are at the forefront. The aim is to find out to what extent there are methods for evaluating production processes. The initial basis is an online survey to determine relevant data and to evaluate the processes within the production processes. The nutritional awareness of consumers has changed in recent years, which is reflected in the renunciation of animal products. Therefore, an objective evaluation and comparability of production methods and the labelling of the respective products is of great importance. Throughout Europe, there are already numerous initiatives on food labelling, but these are often not very transparent.

The advantages and challenges of an evaluation system for standards in the egg sector are therefore a particular challenge. There are a large number of claims and seals, but they are not conclusive in themselves in terms of comparability. The aim of the research is to find out to what extent an objective evaluation is possible. This is the real challenge of the work.

This results in extensive questions about the respective contents of the specifications. Using hypotheses, an evaluation is carried out to find out what possibilities there are for an assessment.

2. Explanations of the research topic

The contents for evaluation and methodology are given:

- Presentation of the initial situation
- Existing systems and their contents
- Sound and scientifically sound evaluation criteria for the process levels
- Online research for general assessment and evaluation
- Stakeholder assessment

- Evaluation of drilldown reporting
- Approaches to existing and new assessment methods
- Creation of criteria and their evaluation
- Grading and criteria
- Evaluation specifications for the systematics
- Analysis
- New findings for evaluation and assessment

The market is structured very differently in the countries surveyed, Germany, Austria, Hungary and the Netherlands. Questions of sustainability and animal welfare standards play a particularly important role in Germany and Austria, while in the Netherlands, where there is a high level of oversupply, the focus is more on the economic aspect. In Hungary, the situation is towards the consumer. Animal welfare issues are not relevant, but the benefits of good food. Although the ban on cage production in the area of egg production also applies, the switch to alternative husbandry systems has been successful in contrast to the other countries, where ground and free-range husbandry dominates in the meantime, but has not prevailed.

2.1. Contents and objectives of the work

The structure of the work procedure is divided into three sub-areas. The target group are economic operators of different orientation, connected with the representation for the evaluation of contents and defaults of existing standards within the range of the egg production. The different requirements in Germany, the Netherlands, Austria and Hungary are to be highlighted and examined on the basis of legal requirements, additional aspects of standard setters, animal welfare and organic production. Of course, economic approaches play a special role in this process, which is reflected in the course of the evaluation and acceptance process.

Systems (Standards)

- First of all, the significance of the respective systems in the field of egg production will be determined, especially with regard to their publicity in Germany, the Netherlands, Austria and Hungary. The basis for this is on the one hand the legal re-

quirements at EU level and additional national regulations. On the other hand, specific requirements of the seal schemes and the associations apply. These include animal protection bodies but also organizations that are present with certain seals in the field of egg production. This applies in particular to the area of organic production.

Online research

- The second area includes an online search. The aim is to find out what significance the respective seal schemes, classifications and specifications have in business enterprises, but also in consumer protection organizations, animal protection associations and the food retail trade. Furthermore, the question is also addressed to authorities, media and science. The result of the questioning is the basis for the further procedure and research.

Evaluation

- The third pillar focuses on a system for evaluating standards. This is also the actual task of the research topic. To date, there are no comparable portals for the evaluation of standards along the entire process chain. Although details are presented in most of the specifications and provisions of the seal schemes, they do not cover the entire area.

Structure and approach		
Overview of the existing seals and standards	Specifications and contents	Target direction
Target group	Economic operators, Food trade, Consumers, Animal welfare, Stakeholders	Evaluation and presentation of content and specifications
BasiC	legal requirements	Standards and further requirements
Sealing programs	further specifications	Added value, economic benefit
Animal welfare	further specifications	Added value, economic benefit

ecological standards	further specifications	Added value, economic benefit
Evaluation	Comparison of specifications and content	objective evaluation and rating on the basis of scaling

Source: own survey

2.2. Research objective and hypotheses

The following overview describes the methodology and approach of the research objectives, theses and hypotheses. An overview of current standards is of great importance for further assessment and is prepared strategically. Within the framework of strategic management, the development, implementation and alignment of content objectives should be presented. The basis for this is initially the respective requirements of the respective standards along the process chain. The hypotheses are validated on the basis of new findings and thus form the basis of the research work on the basis of which new findings are ultimately derived.

Research objective	
Hypotheses	
Subject-specific literary knowledge	
Economic benefits	
Overview of common standards	Assessment and evaluation
<ul style="list-style-type: none"> • Conventional farming methods • Alternative production (soil and free-range farming) • Standards evaluated for animal welfare • Ecological standards 	<ul style="list-style-type: none"> • Definitions and requirements • Animal welfare and animal welfare aspects • Sustainability issues • Traceability and traceability • Control and verification along the process chain
Data analysis, empirical investigation, evaluation options	
Secondary research	Primary research

Collection of basic data	Evaluation
Online research	Result and evaluation
Statements and findings from the online survey	Evaluation of the results
Basis for a new evaluation system	Evaluation of specifications for standards along the entire process chain
Checklists	Evaluation
Evaluation of existing standards on the basis of new findings	Evaluation of the results
Marketing	Advertisement, Representation
Statements on the research objective and results	
Validation of hypotheses	
Derivation of new findings	

Source: own survey, 2018

2.2.1 Research objective

The research objective and research questions are intended to convey an evaluation of standards according to empirical and scientific findings. The principles consist in the respective specifications of the different systems. However, the meaningfulness is often not given, so that comparability should be achieved within the framework of an evaluation. This serves the entire process chain, but above all the market participants and consumers, in order to get an orientation about the respective specifications.

In particular, it must be pointed out where are the advantages and disadvantages of such an evaluation system. Ultimately, in addition to consumer education and information, it is also important to present economic advantages for the respective companies. Higher standards also mean higher costs and investments.

Research objective 1:	Research question
Statements on standards and seals are available in very large numbers with different interpretations.	Is a valuation system suitable for creating transparency for all market participants?
Research objective 2:	

The economic benefit is of great importance for all parties along the entire process chain.	Which findings can be derived from an objective evaluation of the respective standards for the participating companies?
Research objective 3:	
The field of competition in egg production and marketing is very large due to increasingly limited sales opportunities. New investments require a clear analysis and evaluation.	Do business management instruments based on an evaluation system offer sufficient guidance and security?
Research objective 4:	
An evaluation system is used to create concrete statements on the respective standards on the basis of new findings.	What is the benefit of presenting the results in a rating scale for market participants and consumers?
Research objective 5:	
The focus is on animal welfare and animal protection. There are numerous initiatives and prizes for more animal welfare.	Do animal welfare and animal protection offer added value?

Source: own survey, 2018

2.2.2. Hypotheses

Hypotheses serve to verify or prove that a presumed or claimed fact corresponds to the circumstances. In scientific theory, the verification of a hypothesis is the proof that it is correct.

The hypotheses listed below are to be tested and evaluated by means of an empirical examination of the data:

Hypothesis 1:	Proposition
The diversity of seals in the egg sector is very varied in the countries investigated, Germany, the Netherlands, Austria and Hungary.	An evaluation system based on a catalogue of criteria for the respective production specifications provides infor-

	information on how credible a seal is in comparison to the statements made by competing systems.
Hypothesis 2:	
The types of egg production (legal requirements, labelling programmes, animal welfare and organic production) are associated with different production costs due to specific criteria and contents. This increases the risk of false statements during marketing.	An objective evaluation system prevents this and creates clarity.
Hypothesis 3:	
A scientifically based evaluation leads to more transparency.	The prerequisite for this is clear valuation parameters. This results in better orientation and market shakeout.
Hypothesis 4:	
The results of the evaluation in a scale of points create clarity and confidence in the respective product. Higher prices can be achieved for eggs from alternative husbandry systems, animal welfare, regionality and organic production.	This is a prerequisite for strategic orientations and a basis for investment decisions.
Hypothesis 5:	
Animal welfare and animal protection have a high priority and influence purchasing behaviour.	This represents an added value and entitles higher prices.

Source: own survey, 2018

2.3. Own surveys and searches

Sealing programs and their meaning are presented very differently in the media. Within the process chain there are very different statements about the respective standards. Therefore, a survey of the important stakeholders is of importance. The Internet or online survey is an important instrument for evaluating and assessing the circumstances. The catalogue of questions has been structured in a very complex way and is intended to give

an impression of how the respective standards are assessed by the various groups (consumers, food retailers, producers, marketers, legislation, animal protection and science).

The following overview provides a global overview of planning and procedures. The questions are intended to present the respective aspects in order to provide an objective assessment of the respective market conditions and standards.

Requirements	Questions	Description
Contents	Why am I running the project?	Evaluation of standards and seals in statement and presentation
Target	What do I want to achieve with the project?	Orientation and directions of the survey for evaluation
Result	Which results can be expected?	objective assessments for orientation and later evaluation
Activities	Contact person, implementation of the survey via Internet	Who are the key contacts who can provide competent answers in terms of subject matter and content?
Evaluation	Analysis and evaluation	

Source: own survey, 2018

2.4. Realisation

The survey covered a total of 25 days from 17 June to 11 July. This was due to the fact that many contact persons were not present due to the holiday period. The questions were posed in German and English. The survey was addressed to more than 600 participants, a total of 384 visitors were registered, of whom 90 participants provided ready-made answers and an additional three from English-speaking countries. Only 219 visits were reported, resulting in a completion rate of 23.4%. It is important to know that the survey of participants is aimed at the responsible management of production and marketing, food

retailers, wholesalers, science and research, the press and services. Participants from Germany, the Netherlands, Austria and Hungary were interviewed, with the majority of the answers coming from companies in Germany.

Survey visitors

384

Total Visitors

90

Finished answers

50

Unfinished answers

244

Shown only

23.4%

Total completion rate

Visit History (17. 06. 2018 – 03.09. 2018)

Source: own survey, 2018

3. Parameters of evaluation, methodology and analysis

The basis for the further evaluation of standards are the specifications of the LWL-Initiative (von der Crone). The aim is to make existing standards and quality programmes comparable and to present a simple, credible and easily understandable assessment of products with animal welfare standards and further-reaching requirements. As a result, standards and increased animal welfare justify higher prices for the respective products.

The overall concept defines eight different parameters which form the basis for the evaluation of the respective standards. The following evaluation parameters can then be derived for the egg sector. These are used for keeping in the different systems, such as the enriched cage, small group keeping, ground and free-range keeping as well as ecological keeping. In order to determine the corresponding data, it makes sense to define certain parameters in order to achieve comparability of the standards. These relate to:

- I Exercise, possibility of movement
- II Facilities
- III Soil quality, climate
- IV Availability of facilities
- V Animal parameters, animal health
- VI Feed, residues. Transparency
- VII Control, quality assurance
- VIII Award, Transparency

The criteria for the respective spheres of influence are evaluated with points and added and the respective specifications described as posture-related parameters.

Evaluation requirement

Evaluation requirement I „Outlet, freedom of movement“							Punkte
colum	1	2	3	4	5	6	
scoring	2	2	2	2	2	2	12,0
negatively	1	0	1	1	1	1	-5,0
Evaluation requirement II „Facilities“							
colum	1	2	3	4	5	6	
scoring	2	2	2	2	2	2	12,0
negatively	1	1	1	1	1	1	-6,0
Evaluation requirement III „Soil quality, climate“							
colum	1	2	3	4	5	6	
scoring	2	2	2	2	2	2	12,0
negatively	1	0	1	1	1	1	-5,0
Evaluation requirement IV „Availability of facilitie“							
colum	1	2	3	4	5	6	
scoring	2	2	2	2	2	2	12,0
negatively	1	0	1	1	1	1	-5,0
Evaluation requirement V „Animal parameters, animal health“							
colum	1	2	3	4	5	6	
scoring	2	2	2	2	2	2	12,0
negatively	1	0	1	1	1	1	-5,0
Evaluation requirement VI „Food, residues, transparency“							
colum	1	2	3	4	5	6	
scoring	2	2	2	2	2	2	12,0
negatively	1	0	0	1	1	1	-4,0
Evaluation requirement VII „Control, quality assurance“							
colum	1	2	3	4	5	6	
scoring	2	2	2	2	2	2	12,0
negatively	0	1	1	1	1	1	-5,0
Evaluation requirement VIII „Award, Transparency“							
colum	1	2	3	4	5	6	
scoring	2	2	2	2	2	2	12,0
negatively	0	1	0	0	1	0	-2,0
total							96,0
negatively							-37,0

Source: own survey

The overview below shows that higher prices are achieved on the market for certain standards. Although production is associated with higher costs, especially in the ecological and animal welfare areas, sales prices are considerably higher than the standard and a significantly higher margin can be assumed.

The basis for calculating production costs and consumer prices for each type of farming is based on own surveys. Secured statistical data are not available. The calculation on the basis of empirical values is, however, real.

Calculation of egg prices for different types of husbandry

€/10 peaces	Cage	Barn	Freerange	Organic	nimal wlefare	brother cock
Retail price	1,15	1,37	1,95	3,30	3,65	4,05
theoretical production costs	1,15	1,32	1,50	1,84	2,07	2,30
Index	100	115	130	160	180	200

Source: own survey

3.1. Evaluation of research questions and hypotheses

The result is an evaluation of the research questions and hypotheses. The set requirements of the research work show the implementation possibilities of an objective evaluation portal that is structured according to the different aspects of the production processes and further requirements with regard to traceability of origin and quality assurance as well as neutral controls for the uniform comparability of the respective seals and standards. This also takes into account the high food safety requirements.

Research questions

F 1:

Is a valuation system suitable for creating transparency for all market participants?

Valuation parameters or systems generally allow an objective evaluation of seals. This has been clearly demonstrated by the results of the evaluation of standards. The respective standards can be clearly presented on a scale of 1 to 100. The scaling shows in a very simple way at which level the respective standard is located. This is a comprehensible and simple scale, especially for consumers. Ultimately, one achieves credibility and trust in the respective product. The decisive factor, however, is that the respective specifications are checked according to the same criteria and validated by neutral certification bodies. This is the only way to ensure that the statements are actually correct. In fact, such a system can offer all market participants transparency and decision-making aids in the investment area and global market assessment.

F 2:

Which findings can be derived from an objective evaluation of the respective standards for the participating companies?

With the evaluation of standards or sealing programs of the respective providers, decisions in the business management sector can be secured. This is an essential aspect and basis for the evaluation. The principle of homogeneity or equal treatment is important, i.e. the criteria for evaluation must be carried out according to a uniform pattern.

The principle of economically oriented companies is to achieve higher prices and thus profits or a positive contribution margin. In fact, the valuations show that a better positioning on the market is possible for certain standards. As a result, production costs are higher, especially in personnel management, but there is still significant added value. What is decisive, however, is that the specifications are adhered to and checked accordingly. Ultimately, this is also the basis for investments in alternative (free-range ground husbandry) or new husbandry systems. Animal protection in particular shows considerable potential. Although this is also associated with high production costs, consumer confidence in animal welfare organizations is significantly higher than that of other standard setters. This also applies to the ecological sector. However, the range here is very wide. The research results show this very clearly. While the EU standard is only evaluated with relatively few points, special labelling programmes can offer significantly better results. The same applies to animal protection.

F 3:

Do business management instruments based on an evaluation system offer sufficient guidance and safety?

An evaluation system along the entire process chain can give clear statements on the respective standards. This is clearly presented and proven with the corresponding evaluation tables. This provides a clear orientation aid for companies along the entire process chain and forms the basis for sustainable investments and new operating orientations or expansions.

The system presented for the egg sector can be used for all areas of animal production and also in the plant sector. It is necessary to create the corresponding parameters based on well-founded knowledge in order to enable an objective assessment.

F 4:

What are the benefits of presenting the results in an evaluation scale for market participants and consumers?

The results can be used to create an evaluation scale. For this there are different possibilities, which are in a scaling of 1 - 100 or an analogous evaluation system, as they are to be found already frequently on sales portals in the Internet or the star evaluation of hotels. A traffic light system can also provide plausible results of an evaluation.

F 5:

What added value does animal welfare offer?

Animal welfare and animal protection are in the interest of consumers. Especially in the field of egg production this is considered very emotionally. The prohibition of cage farming, beak treatment or currently the killing of male chicks are examples of this. That is why an evaluation of production standards is of great importance, because the results provide information on the conditions under which the animals were kept.

Hypotheses

In the countries examined, Germany, the Netherlands, Austria and Hungary, there are sometimes very different requirements with regard to animal welfare standards and the willingness to pay significantly more for certain products. This is clearly demonstrated by the requirements for keeping laying hens. In Germany, Austria and the Netherlands there are only alternative animal husbandries, whereas in Hungary this type of husbandry is hardly to be found. Nevertheless, standards are very important in all countries. Quality and food safety also play a very important role. However, the evaluation of products with a high significance through seals is carried out in different ways. This is also the reason why, especially in Hungary, animal welfare aspects are less in focus than in Germany and

Austria. However, this does not mean that animal welfare is neglected, but only that consumers are less willing to spend more money. Therefore, an evaluation of standards regarding the statement is of extraordinarily large importance.

The price differences between the various types of farming are very large. Especially for eggs marketed under the animal welfare label, the price differences are several times higher than the standard. This also applies to organic products. The gap is even greater when compared to cage products.

The hypotheses put forward apply after the evaluation. All statements can be answered with exceptions unequivocally with "Yes". However, the respective statements have to be considered in detail. Because the market conditions are different in the respective countries examined. Consumer behavior in particular appears to have a major influence on market conditions. While in Germany the share of alternatively produced eggs is very important, this is only true to a limited extent in Hungary. This also applies to the Netherlands. Although the share of alternative products has increased significantly, the primary target is sales on the German market.

H 1

In Hungary, the number of seals is of lesser importance. There are comparatively few awards in the field of organic production. Animal welfare is virtually non-existent. EU-approved cage farming continues to dominate. Nonetheless, transparency is of paramount importance, especially food safety and traceability in the event of complaints and residues. This also applies to the other countries Netherland, Austria and Germany. However, hardly any eggs from caged farms are still offered here, the focus being on soil and free-range farming. Seal schemes are moving more and more into the foreground, especially ecological production, but also animal welfare and animal welfare programmes.

For all standards and systems, however, an evaluation system based on a catalogue of criteria provides information on how credible the respective seals are compared to the statements of competing systems. This means that the hypothesis is 100% true for all the programmes examined.

H 2

The legal requirements represent the minimum standard. The production costs can be derived relatively easily from existing standards and are therefore largely transparent. Sealing programs with more extensive requirements are, however, associated with additional effort and costs. The additional requirements must therefore be calculated differently from the minimum standard. This is particularly evident in the area of ecological production. Stocking density, feed from the region, sustainability and additional requirements for management and marketing are linked to investments. This also applies to animal welfare. Here, more far-reaching criteria apply which involve higher expenditure.

This increases the risk of fraud that eggs produced on a standard basis will be sold as organically produced goods or goods produced under animal welfare aspects. An objective evaluation system can largely prevent this. The prerequisite, however, is that the marketing channels and thus the traceability are clearly traceable. This is one of the basic prerequisites for transparency and traceability. If this can be presented 100 %, the statement of the hypothesis applies 100 %.

H 3

A scientifically based evaluation of standards gives clear statements on the respective process flows. This ensures transparency, provided that the evaluation parameters are based on the same specifications. For market participants, the result of such an evaluation clearly provides guidance and a basis for further investments. However, it is difficult to assess the extent to which a market shakeout is taking place. The risk of fraud and false statements on the labelling of the respective products can be detected more quickly. That is why there will be a market shakeout in the longer term. Transparency does not provide a basis for false statements. The hypothesis presented is correct, but with limitations due to the risk of false statements.

H 4

The evaluation of standards on a scale of points gives all market participants, especially consumers, a clear picture of the respective product. The results are easy to understand. The achieved score reflects the value of the respective product. The higher the result, the better the standard or product. This makes it very easy to present a transparent and comprehensible result. The consumer can see immediately what the product is and the price

for the respective product can find justification at the time of purchase. The statement of the hypothesis is 100 % correct.

H 5

Animal protection and animal welfare have a very high value in the favour of consumers. However, this has to be considered differently in the respective countries. Ethical reasons play a role, but also the presence of the respective animal welfare organisation. This is particularly the case in Germany and Austria, while in the Netherlands and especially in Hungary it is less important. Therefore, the statement must be regarded differentiated. In Germany and Austria there is a significantly higher willingness to spend more money on these products, whereas in the other two countries examined this is not the case or only to a limited extent. In principle, animal welfare represents an added value and justifies higher prices due to stricter production specifications. This is also shown by the results of the evaluation. In this respect, the statement of the hypothesis is correct.

3.2. Limits of analyses and research results

Standards are difficult to analyze in verification. There is not always a clear transparency with regard to the specifications. The requirements, in particular the testing systematics, are often only made available on request and justification. A comparability is therefore often only conditionally given. The goal of the research work has extended to occurrences along the entire process chain, because only in this way is it possible to objectively evaluate the respective criteria. Although traceability and traceability are now legally anchored throughout the EU, there are still different approaches. On the one hand only the respective stage is represented, on the other hand only the goods movements, which offer at the end of the involved possibilities of an adjustment.

4. New scientific findings

The evaluation of standards in the food industry is very topical. The chosen topic of the paper "Advantages and challenges of an evaluation system of standards in the field of eggs" should provide new insights and statements on the respective seals and their contents. It is therefore important to include the entire process chain. These include agricultural production, specifications for animal processing, marketing, quality assurance, control and traceability, but also sustainability, the social environment and animal welfare.

Statements on ingredients such as sugar, fat, salt and other ingredients were not part of the work and evaluation. There are already numerous initiatives of the food industry, such as the so-called food traffic light or Nutri-Score on statements on calorie information and ingredients. This is a different approach.

The evaluation system of standards in the area of eggs serves primarily as an orientation aid for all stages involved in the process. The production methods and statements on the standards awarded are in the foreground.

What is new is the procedure with regard to the evaluation of the respective parameters. Up to now, there has been little evidence of how the respective processes at the various levels can be neutrally evaluated. The parameters of the different production conditions, standards, animal welfare, sustainability are in the context of the legal requirements. Basic information on traceability and tracing has not yet been verified in its entirety using a points system as a comparison portal. For the first time, it will be possible to make well-founded statements about the respective standards. This was the actual aim of the research, to prove that statements regarding husbandry, requirements for environmental criteria and sustainability issues can be presented with a neutral and uniform scheme.

The evaluation system provides important statements and information about the production methods in the field of laying hen husbandry. It can be used as a basis for decision-making in the operational area.

- The work on the validation and evaluation of standards in the food sector makes high demands. An expert survey was used to find out how the respective standards in the market for shell eggs are assessed by those involved in the market. Although the results are very different, there are still new findings:
- In many cases, the multitude of different seals are not transparent in their expressiveness. An objective evaluation according to given parameters enables a clear statement to be made about the respective systems. This gives providers the opportunity to position themselves better in relation to their competitors.

- On the basis of the knowledge gained, a neutral evaluation and scaling according to a points system is created. Thus there are possibilities of an objective comparability of the different standards and seals. Against this background, it will be possible in future to make clear statements about their contents.
- The respective parameters for evaluating the standards can be adapted to developments, market conditions and consumer wishes at any time. At present, analogous initiatives are already on the market, such as the classification into four categories initiated by food retailers. However, the model is not comparable in any way and is not very meaningful because it is based exclusively on existing data. However, it is crucial to include the entire process chain. In Germany, legal requirements for more animal welfare should also offer additional incentives. This meets in particular with opposition from animal welfare activists and consumers. The present work enables approaches for an objective evaluation of the variety of standards and seals. The result is the classification according to stars, analogous to the evaluation of many other schemes, e.g. portals for the categorization of hotel standards.
- The work has created the basis for a transparent evaluation system in the egg sector. The knowledge gained can be extended to all areas of animal production. Approaches are already available for chickens for fattening, pigs and rabbits.
- The evaluation according to a point system is easy and comprehensible. There are already numerous portals, which evaluate products, services, hotels, etc. with 1 to 5 stars. Therefore, such a classification is also suitable for standards and seals.

Summary

The advantages and challenges of an evaluation system for standards in the egg sector are directly related to the evaluation of standards or quality labels. Unfortunately, there is so far little scientific knowledge and information available on this subject. However, the increasing flood of seals is leading to a rethink. In the meantime, there are numerous initiatives, both from the legislation and from the economic operators, in particular the food retail trade, but also from consumer protection organizations and NGO's. Some realizations from more recent studies could be derived, whose statements did not concrete

however the entire process chain. Important information was obtained on the basis of the on-line survey, in particular to assess the significance and evaluation. However, this is also only a global assessment.

The evaluation scheme developed for the area of eggs and laying hen husbandry is based on the specifications of the respective production stages. At the same time, criteria for securing the future, transparency, control and sustainability as well as animal welfare and quality assurance are also included. All criteria along the process chain are evaluated according to a uniformly defined points system. This is the first time that the basis for the comparability of the respective seals has been created on the basis of a scale of points. In some areas of the food industry there are already corresponding portals, but not across all stages of the process chain. With the new evaluation system, standards and seals can be objectively assessed and compared for the first time.

The system is structured transparently and can also be extended to other areas of animal and plant production. The evaluation is carried out on the basis of the publicly available specifications of the respective production standards. This created the basis for a universally applicable system. It is also important that the specifications are neutral and sound according to scientific principles. This is the only way for an objective assessment to take place, and this is for credibility in the representation of interpretation.

With the definition of clear evaluation criteria that correspond to the current state of research and science, aspects of husbandry, management and animal health are equally taken into account. This includes a clarification of the added value for market participants and consumers through appropriate labels with a recognition value.

The classification into 3 categories has proven to be effective: Standard, Premium and Excellent. This is understandable for participants and justifies on the one hand higher prices for suppliers and on the other hand the acceptance of consumers to pay more for higher standards. It is crucial that the content and specifications are transparent at all stages of the value chain.

For market participants, there are clear and verifiable market assessment advantages. Higher standards, which as a rule are associated with additional costs, can be credibly

presented as such. This results in an economic benefit and justifies investments or new business models.

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5. Own publications

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