THE ECONOMICS OF FOOD QUALITY STANDARDS

Prof. Dr. Tilman Becker

Institute for Agricultural Policy and Markets
University of Hohenheim

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Germany

This paper covers very shortly some of the results of a larger research effort. More details are available in six country reports on national consumer behaviour, six country reports on national quality policy, a summary report on consumer behaviour, a summary report on quality policy and a final report linking both parts together. These reports can be downloaded from the project homepage http://www.uni-hohenheim.de/~apo420b. The project has been founded as FAIR CT95-0046 within the 4. Framework Programme of the European Commission. The project title is "Quality Policy and Consumer Behaviour". The financial contribution of the Commission is acknowledged. The views taken here are the views of the author and do not neccessarily reflect the position of the European Commission.

Abstract: In this paper a theory of food standards is developed. It is distinguished between extrinsic and intrinsic quality cues and between experience (eating) quality and credence quality. Based on these distinctions, the economics of food standards is spelled out. The theoretical considerations are illustrated with the results of a consumer survey in several member states of the European Union. In this survey, the extrinsic and instrinsic cue, the experience and credence quality attributes for freh meat are evaluated by European consumers. In particular, information is presented on the helpfulnes of cues for predicting eating and credence quality. Furthermore the importance of several experience and credence quality attributes is investigated in detail. Consequences for public policy are drawn.

The Economics of Food Quality Standards

The economic literature on standards, from the the pioneering papers in this field[1] till more recent contributions[2] explains the need for standardization within the compatibility or the network externalities approach.[3] The economic gains from compatibility are regarded as the driving forces for standardization. Economic gains may accrue due to positive network effects, which arise when a good is more valuable to a user the more users adopt the same good or compatible ones. Good examples are telephones and fax machines. The more users are connected to a telephone or fax machine, the more useful and valuable is a telephone or fax machine for a particular user.

These network effects may by arise directly on the demand side or indirectly. Farrell and Saloner (1985) call these indirect network externalities the "market-mediated effect", while Shy (1995) uses for basically the same issue the term "supporting services approach". An example of the indirect effects are the compatibility of the hardware (or the operating system) and the software for computers. Both are complementary goods (like a product and its supporting services) and a standard on the market for operating systems will induce a larger variety of software available for use with operating systems confirming to this standards.

Compatibility is clearly an important issue for components. This is treated in more detail in the "components approach" how Shy[4] calls it, or "mix and match" framework how Matutes

[1]Katz, M. and C. Shapiro,: Network Externalities, Competition and Compatibility. In: American Economic Review 75 (1985), pp.424-440; Katz, M. and C. Shapiro: Technology Adaption in the Presence of Network Externalities. In: Journal of Political Economy 94 (1986), pp.822-841; Farrell, J. and G. Saloner: Standardization, Compatibility, and Innovation. In: RAND Journal of Economics 16 (1985), pp.70-83; Farrell, J. and G. Saloner: Coordination Through Committees and Markets. In: RAND Journal of Economics 19 (1988), pp.235-252; Farrell, J. and G. Saloner: Installed Base and Compatibility: Innovation, Product Preannouncement, and Predation. In: American Economic Review 76 (1686), pp.940-955.

[2] Compare the review by Matutes, C. and P. Regibeau: A selective review of the economics of standardization - Entry deterrence, technological progress and international competition. In: European Journal of Political Economy Vol. 12 (1996), pp. 183-209; and Holler, M. and J.-F. Thisse: The economics of standardization: Introduction and overview. In: European Journal of Political Economy 12 (1996), pp.177-182. A bibliography on the literature on standards is available from the Internet URL: http://www.unibw-hamburg.de/MWEB/nif/fnm/jk/biblio.htm (August 5, 1998) covering more than 350 publications.

[3] In economic literature, standardization and compatibility respective network effects seem to be regarded as inevitable linked together. Examples of this view are the textbooks by Tirole, J.: The Theory of Industrial Organization. Cambridge, Mass.: The MIT Press, 1990, and Shy, O.: Industrial Organization: Theory and Applications. Cambridge, Mass.: The MIT Press, 1995. These approaches to standardization, as will become obvious when regarding food quality and safety standards, have their severe limitations. Their main limitation beeing for our research, that standards of importance for the food sector, are not compatibility standards. Furthermore network effects are not as important for food products as for telecommunication, on which the economic literature on standards is focusing.

[4] Shy, O.: Industrial Organization: Theory and Applications. Cambridge, Mass.: The MIT Press, 1995.

and Regibeau[5], to whom Shy attributes this approach, call it themselves. Compatibility issues may arise not only due to positive network externalities for the same good, the direct effect, for other goods supplementing the good under consideration, the indirect effect but as well for components. Examples for these network externalities are the parts of a computer system (basic unit, monitor, printer etc.). The parts are perfect complements since a consumer cannot use one component without the other. Generating product diversity by combining different components becomes an important issue in this case.

Compatibility standards are of high importance for telecommunication, but less so for food.[6] The following example of a consumer purchasing fresh meat may illustrate this. The consumer enters the shop. The handling and treating of the food, which is offered, is regulated with several hygiene standards: for food in general, for meat and for minced meat, chicken and beef in particular. These standards are controlled by the public food control organizations, which are controlled themselves against the standards on the EU level by the European Commission. Labelling regulations set standards for price and product labelling. The weigher used to weight the meat is controlled against a certain measurement standard etc. Compatibility or network externalities in the sense above are no issue for most of these standards set by public regulations.

How to explain the existence of food standards? And even more demanding: Should the state set standards or leave it to the market, to coordinate on standards? But before these questions can be answered, we have to present the analytical framework used for answering these questions.

[5] Matutes, C. and P. Regibeau: A selective review of the economics of standardization - Entry deterrence, technological progress and international competition. In: European Journal of Political Economy Vol. 12 (1996), pp. 183-209.

[6] There may be some resemblance to direct network externalities due to the role of word of mouth information for food consumption behaviour. The more people choose and know a brand, the more likely that a particular consumer receives positive information on this brand by other consumers, and the more likely that the particular consumer will purchase the product. But this issue is more adaequatly treated by focusing on the information. Here the theory of informational cascades (compare the recent publication by Bikhchandani, S.; D. Hirshleifer and I. Welch: Learing from the Behaviour of Others: Conformity, Fads, and Informational Cascades. In: Journal of Economic Perspectives Vol. 12 (1998), pp.151-170) may be applied to offer more insights. Network externalities for food products could result as a consequence of the information dissemination processes but do not arise from consumption process of other consumers directly.
Some kind of indirect network externalities could be constructed from the fact that a meal consists of parts. The higher the compatibility of a part with other parts for the preparation and arrangement of the meal, the higher the indirect or market mediated positive network externalities for the other goods. This is regarded of minor importance for the issue investigated here in this paper.

FRAMEWORK FOR ANALYSIS

Quality is an ambiguous term. The understanding of this term depends crucial on the individual preferences. The International Organisation of Standardization (ISO) supplies us with the most popular and probably the only definition on food quality agreed by almost all people coming from different backgrounds and working in this area, either in politics, industry or sciences. Quality is defined here as: "the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs."[7]

The Total Quality Management literature does not provide a more detailed definition. Quality is according to Crosby the "conformance to requirements", or quality, as defined by Juran is "fitness for purpose".[8] Rather similar the German Association for Quality: “quality is the entirety of features and characteristics of a product, which refers to the fitness to fulfil given needs“.[9]

This definition is so general that it is not useful for analytical purposes. Two different and contradicting[10] analytical conceptions of quality are used in the literature on food quality. While the consumer behaviour and marketing literature favours the consumer perceived quality approach, the food sciences literature puts the emphasis on the measurable quality approach. While the former is based on the perception of the consumer, the later is based on objective product quality. The consumer behaviour approach towards quality will be denoted the quality attribute approach and the food sciences approach, the product characteristics approach.[11]

The product attribute approach is based on a demand side and the product characteristics approach is important for the supply of quality. Accordingly each approach represents one side of the coin. The market outcome for quality is determined by the supply of characteristics and the demand for attributes and the information of the consumer on this attributes.

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[7] Compare ISO 8402.

[8] Compare Barker, B. and N. Kastrinos: Quality Improvement and Competitiveness. In: Barker, B. (ed.): Quality Promotion in Europe. A Review of European Community Member States´ National and Regional Schemes and Measures in the Field of Quality. Commissioned by Sprint, the Strategic Programme for Innovation and Technology of the European Communities, Aldershot: Grower Publishing, 1994.

[9] Deutsche Gesellschaft für Qualität (ed.): Begriffe und Formalzeichen im Bereich der Qualitätssicherung. Schrift Nr. 11-04, 1980.

[10] This conflict becomes evident in the beef hormones issue. While the European Union is here in favour of the perceived quality approach, the US claims, that no scientific evidence is available to confirm consumer perception that hormone treated beef is of inferior quality. While the EU bans the imports of hormone treated beef, the US claims that this is a violation to the GATT.

[11] This distinction between characteristics and attributes is emphasized in Bowbrick, P.: The economics of quality, grades and brands. London and New York: Routledge, 1992.

Both approaches can be unified on the basis of the Lancastrian[12] approach towards food quality. Here product quality is assumed to consists of different (objectively measurable) characteristics. Overall quality perception is assumed to be decomposable into characteristics. Not the product itself is utility generating, but the characteristics of the product are regarded as arguments in the utility function. The Lancastrian approach introduces a mapping from the product space to the characteristics space, before utility is derived. According to the discussion above, we regard the attribute space as the argument in the utility function. We will simplify matters by focusing on one product.

The supply sides supplies a product with certain characteristics. These characteristics are communicated with intrinsic and extrinsic cues to the consumer while shopping. The consumer receives the cues and makes prediction of the quality of the product on the basis of these cues received while shopping and other sources of information.

Accordingly we extend the Lancasterian approach by assuming, that, though attributes are the arguments of the utility function, these attributes are (in general) not certain for the consumer. Consumers have to rely on cues for quality selection in the shop. It is obvious with this model that quality cues, used for quality selection, are, at best, indicators for quality.

The food consumer demands organoleptic quality attributes, but increasingly extrinsic quality attributes, like animal welfare, environmental friendly production etc. are becoming important. These extrinsic product attributes are mainly focusing on the quality of the process to produce the product and not on the product itself.

Attributes can be experienced by eating and/or indicated from information supplied. Process quality attributes are not intrinsic to the product and as such can not be communicated with the product itself. Here the consumer has to rely on cues received while shopping. Furthermore word of mouth, newpapers etc. play an important role for communicating process characteristics to the consumer.

[12] Compare Lancater, K.J.: A New Approach to Consumer Theory. In: The Journal of Political Economy, Vol. 74, No. 2 (April 1966), S. 132-157; Lancaster, K.J.: Consumer Demand: A New Approach. New York: Columbia University Press, 1971; and Lancaster, K.J.: Variety, Equity and Efficiency. New York: Columbia University Press, 1979. The generalized Lancaster model and the Houthakker-Theil model are discussed in Hannemann, W.: Quality and Demand Analysis. In: Rausser, G.C. (ed.): New Directions in Econometric Modeling and Forecasting in U.S. Agriculture. New York: Elsevier Science Publishing, 1983, pp.555-98. While the Lancaster approach presumes a discrete set of alternative qualities, the Houthakker-Theil model presumes a continous spectrum of alternative qualities.

Our approach has some resemblance to the search-, experience-, and credence quality attribute approach prominent in the industrial economics literature.[13] This approach has undergone some modifications from the pioneering papers in this field[14] to the more recent use of this approach in the literature.[15]

Search goods, as introduced in the economic literature, denoted those goods, where there are search costs involved to search for quality. With each further step of search, the sample of qualities available for choice increases. Search quality is accordingly the quality, which is available for inspection. The consumer behaviour literature adapted the term "search quality" in this definition, without giving attention to the sampling aspect. Search quality is understood here as the quality known by inspection in the shop, therefore sometimes denoted as inspection quality.[16]

We will further modify this approach by using the term "quality in the shop" instead of "search quality attributes". This is not just another word for the same content, but includes as well another meaning. "Quality in the shop" does not consists of quality attributes but of cues or indicators for the product quality in consumption. The quality detected in the shop is regarded here as not directly utility generating, acordingly we will not use the term "search quality attribute". The "quality in the shop" consists of cues predicting the quality in consumption.

Experience quality attributes were introduced in the economic literature as those attributes, where the user has to consume the product to experience the quality. Accordingly we will use the term "experience quality" or, more understandable for consumers, "eating quality".

Credence quality, like search quality, is not a standardized concept in the literature. The usage of the term credence quality has undergone some modifications in the last decades. Darby and

[13] Compare for example Krouse, C.G.: Theory of Industrial Economics. Cambridge: Basil Blackwell, 1990, pp.510-542; or Carlton, D.W. and J.M. Perloff: Modern Industrial Orgaization. New York: Harper Collins College Publishers, 1994.
[14] Nelson, P.: Information and Consumer Behaviour. In: Journal of Political Economy, Vol. 78 (1970), pp.311-329; and Darby, M.R. and E. Karni: Free Competition and the Optimal Amount of Fraud. In: Journal of Law and Economics, Vol. 16 (1973), pp. 67-88.
[15] Andersen, E.S. and K. Philipsen: The Evolution of Credence Goods in Costumer Markets: Exchanging 'Pigs in Pokes'. Working Paper Draft January 10, 1998 and Caswell, J.A. and E.M. Mojduszka: Using Informational Labeling to Influence the Market for Quality in Food Products. In: American Journal of Agricultural Economics Vol.78 (December 1996), pp.1248-1253.
[16] For example Kaas, K.P. and A. Busch: Inspektions-, Erfahrungs- und Vertrauenseigenschaften von Produkten. In: Marketing ZFP Heft 4, 4. Quartal 1996, pp.243-252.

Karni [17] introduced this term to analyse markets in which the information asymmetries between seller and buyer are such that sellers are also experts who determine costumers' needs: "The possibility of this situation is suggested by the observation that in a considerable number of cases involving medical, automotive, and other repair services, contrary to the basic assumption of conventional demand theory, the consumer is unaware of the ability of the repair service to satisfy a given want."

This understanding of the term credence quality referring to goods and services whose sellers are also the experts who determine the costumers' needs is used as the conceptual basis for a growing branch in the economic literature. An overview on this literature is given by Emmons.[18] This usage of the term credence quality is a more particular one than in the consumer behaviour oriented literature.

In the consumer behaviour literature "credence quality attributes" denote those features of the product, which are important for the consumer, but which are not experienced in consumption.[19] Accordingly we will use the term here.

Credence quality attributes, as defined so far, include diverse issues like animal welfare and environmental concerns, but as well food safety issues like use of antibiotics as growth promoter, use of hormones or BSE. Further differentation is here needed for further analysis. We will distinguish between:

- Food safety (including hygiene) credence attributes
- Health credence attributes
- Rest of credence quality attributes.

If the repair and service approach, as pursued by most of the literature on credence quality, is taken care of, another category

- Bundled credence attributes

[17] Darby, M. R. and Karni, E., "Free Competition and the Optimal Amount of Fraud", Journal of Law and Economics, Vol. 16, 1973, p. 67.
[18] Emmons, W., "Credence goods and fraudulent exports", RAND Journal of Economics, Vol. 28, 1997, pp. 107-119
[19] For a discussion on food safety as a credence attribute compare Caswell, J.A.: Use of Food Labelling Regulations. OECD Working Paper on Agricultural Policies and Markets, 1997 or Caswell, J.A. and E.M. Mojduszka: Using Informational Labeling to Influence the Market for Quality in Food Products. In: American Journal of Agricultural Economics Vol. 78 (December 1996), pp.1248-1253.

has to be added.[20] But this category is of no direct importance for food standards.

We will regard eating and credence quality as two fundamentally distinct quality dimension.[21] This distinction will give the foundation for the economics of food quality standards, as developed here.

For the "quality in the shop" we will differentiate between extrinsic and intrinsic cues. This distinction is well established in the literature on food quality. Steenkamp gives an extended overview on the literature on cues as predictors for quality.[22] The distinction between extrinsic and intrinsic cues is attibuted to Olson.[23] Other work in the area of food quality adapted this distinction.[24] Our research supports this distinction as well. In a factor analysis (Main components analysis, Kaiser-Criterium, Varimax Rotation) the factors behind the attributes were extracted. The two factors extracted have high factor loadings either on the set of intrinsic or extrinsic attributes.[25]

The consumer selects quality in the shop on the basis of the information received. Information may be received during shopping in the form of cues or by other sources of information, like word of mouth, media etc. The information received from cues is used by the consumer to select quality in the shop before purchase and to predict eating and credence quality. The quality cues may be intrinsic or extrinsic to the product. While the eating quality is experienced in consumption, this does not hold for the credence quality. These quality attributes are not known even after consumption. Here trust in information and confidence in information sources becomes important.

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[20] This term is owed to Anderson, E.S. and K. Philipsen: The evolution of credence goods in costumer markets: exchanging 'pigs in pokes'. Working Paper Draft, January 10, 1998. But their categories of credence quality attributes seem to mix up experience and credence attributes and are not used here.

[21] Empirical work supports this assumption, compare Kaas, K.P. and A. Busch: Inspektions-, Erfahrungs- und Vertrauenseigenschaften von Produkten. In: Marketing ZFP Heft 4, 4. Quartal 1996.

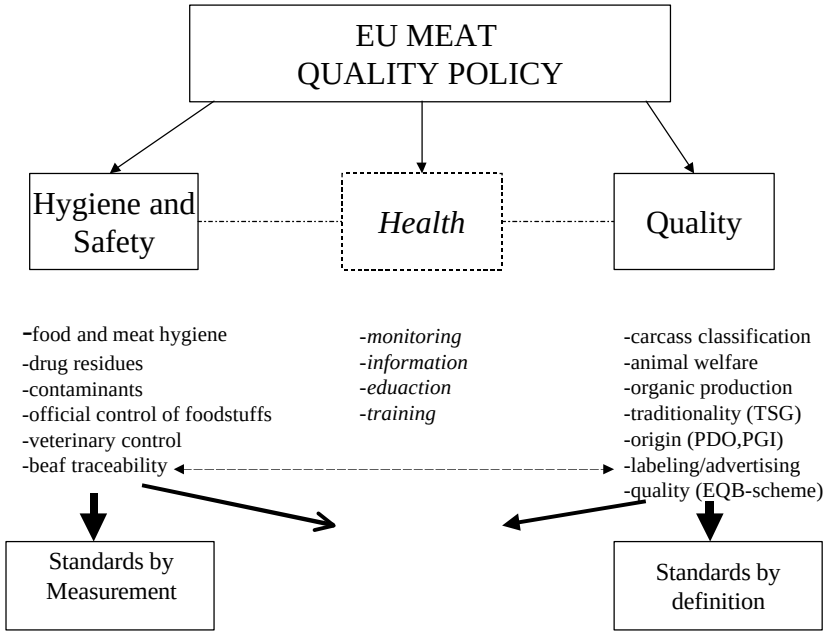
[22] Steenkamp, J.-E.:Product Quality. Assen: Van Gorcum, 1989.

[23] Olson, J.C.: Cue Utilization of the Quality Perception Process: A Cognitive Model and an Empirical Test. Unpublished doctoral dissertation, Purdue University, 1972 cited according to Steenkamp. This dissertation was not available for the author of this paper, but the framework is described in detail in the book by Steenkamp, cited above.

[24] First of all in Steenkamp, J.-B.: Product Quality. Assen: Van Gorcum, 1989; in Steenkamp, J.-B.: Conceptual Model of the Quality Perception Process. In: Journal of Business Research Vol.21 (1990), pp.309-333; and in Steenkamp, J.-B. and H.van Trijp: Quality Guidance: A consumer-based approach to food quality improvement using partial least squares. In: European Review of Agricultural Economics Vol. 23 (1996), pp.195-215. But as well in Grunert, K.G.; A. Baadsgaard, H.H. Larsen and T.K. Madsen: Market Orientation in Food and Agriculture. London: Kluwer Academic Publishers, 1966 and in Grunert, K.: What's in a steak. A cross-cultural study on the quality perception of beef. In: Food Quality and Preferences Vol. 8 (1997). Our approach to perceived quality is rather similiar to the one pursued by Steenkamp (1990). The main theoretical innovation of our paper is, that we refine this approach and link it to the economic theory of market failures to derive conclusions for public quality policy.

[25] In a few cases only one factor was extracted.

Figure 1: Areas Covered and Standards Used by EU Meat Quality Policy



Our framework makes it possible to link the consumer model presented above with public quality and accordingly to answer the question posed in the beginning: How to explain the existence of food standards? and: Should the state set standards or leave it to the market, to coordinate on standards?

Public policy can define cues for attributes. For example the cue "organic" has been defined for farm plant production on the EU level and is about to be defined for farm animal production. Furthermore public policy regulates the cues allowed to communicate to the consumer. Besides the more general prohibition of consumer deception, several labelling and advertising regulations together with regulations on unfair competition cover in detail, what is not allowed to communicate, for example health claims may not be used in advertising.

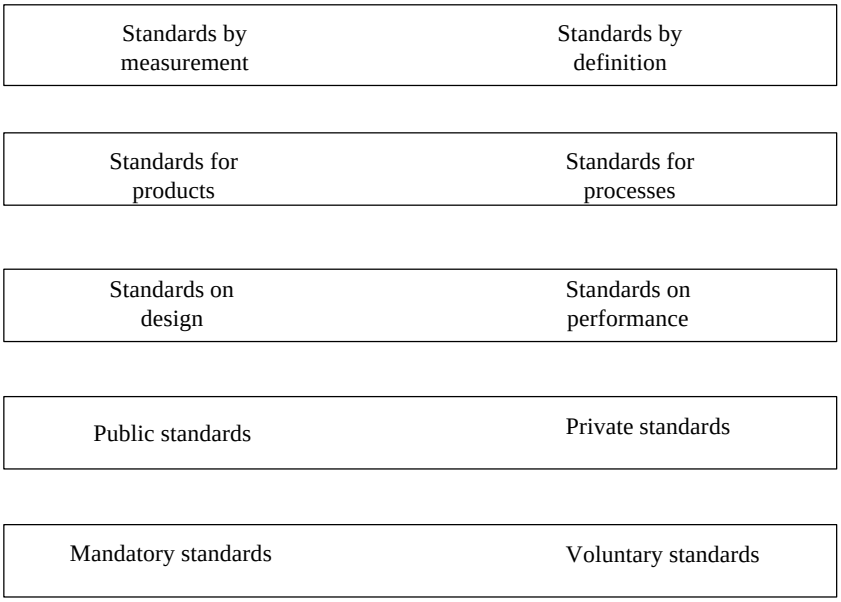
We can not cover here the regulatory efforts towards food in general or even only meat quality in detail, but figure 1 is intended to give an overview. In the area of food safety, standards mainly focus on minimum (or maximum) levels. These standards rely on measurement. But methods for measurement have to be defined. Accordingly both kinds of standards, standards by measurement and standards by definition are used in the area of safety.

In the area of "rest of credence quality", regulatory control relies on standards by definition. Again, these standards have to be defined in a non-ambiguous manner. Obviously,

definitional standards are the prerequisite for communicating any other form of standards. Here the last instance of resort is the European Court to supply the "right" definition.

In figure 1, the nature of the respective kind of standard for hygiene and safety respective quality is concluded. Figure 2 supplies the complete classification of food standards:

Figur 2: Classification of food quality standards



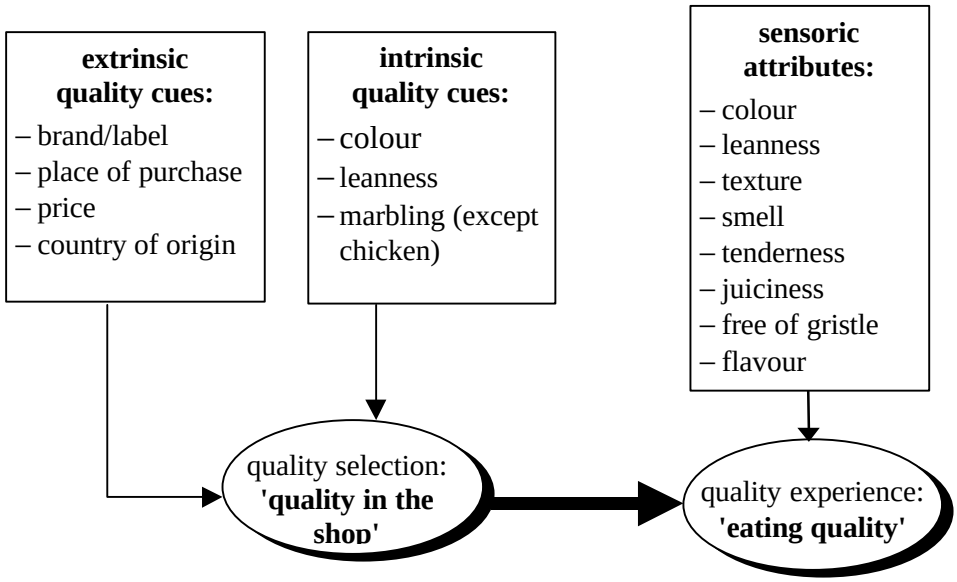
Here and in the following we will focus on fresh meat as an example, because here the perceived quality problem is most important for all food products. This is documented not only for Germany[26] but as well for each other Member State of the European Union.[27]. It is interesting to note here, that in general perceived quality is getting worse for those products, which are sold to a large extent not prepacked but over the counter, like fresh meat and fresh fish.

Focus groups (2-3 per country) on meat have been conducted in each of the countries participating in this study. Extrinsic and intrinsic cues of help in assessing the eating quality and the safety of meat were elected from the focus group sessions. Furthermore the most important organoleptic quality attributes and the salient concerns on the safety of meet as they came out of the focus group sessions were used in the questionnaire. The survey data was

[26] Compare Alvensleben, R.v.: Das Imageproblem bei Fleisch -Ursachen und Konsequenzen-. In: Berichte über Landwirtschaft 73 (1995), pp.68-82.
[27] International Research Associates (INRA): Eurobarometer 47.0, 20 March 1997.

collected through telephone surveys. The survey was conducted by a commercial telephone survey organisation, using random-digit dialling procedures, in March 1997. This is one year after the announcement of the Health Minister of the United Kingdom Stephen Dorrell, that a link between BSE and the human degenerative brain disorder Creutzfeld-Jakob Disease could not be ruled out. The questionnaire was designed in English. The translated questionnaires were checked by native speaking experts, which conducted already the focus groups, on consistency with the English worded questionnaire. Consumers in six countries of the European Union (Germany, Ireland, Italy, Spain, Sweden, United Kingdom) were interviewed and 500 successful interviews per country conducted. The interviewed persons had to answer the same set of questions for beef, pork and chicken separately.

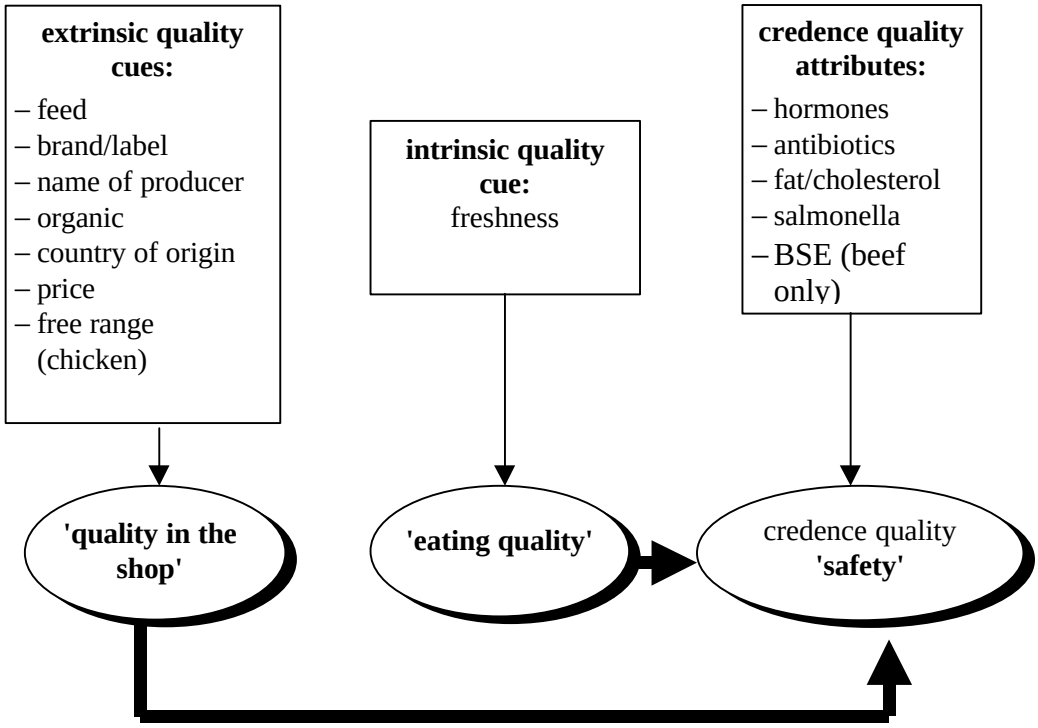
Figure 3: Predicting Eating Quality



The consumers were asked to judge the helpfulness of intrinsic and extrinsic cues “in assessing the eating quality of meat while shopping.” It has to be stressed here, that we did not ask for quality in general but "eating quality" in particular to focus attention of the consumer on the organoleptic experience. "Eating quality” is a term easy to understand and easy to translate. The extrinsic and intrinsic quality cues used in the survey, as an outcome of the focus group sessions, are presented in figure 1. These cues were rated by the consumer on a 5-point scale ranging from "very helpful (1), "quite helpful", "neither", "not very helpful", to "not at all helpful" (5). All the cues presented in figure 1 were rated on average in each country and for each meat as very helpful or quite helpful, with price being the least helpful quality cue with an average rating of 2,7 on the scale.

To get a better understanding of the eating quality perceived by the consumer, we asked for sensoric attributes:"How important or unimportant are each of the following for assessing the eating quality of beef "(or pork or chicken, seperately for each category). The attributes used in the survey are presented in figure 1. All these attributes rated on a 5-point scale frome"very important" (1) to "not at all important" (5) for each country and each meat as very or quite imporant, with no attribute rating lower than 2,5 on average.

Figure 4: Predicting Credence Quality



For the prediction of credence quality cues are received while shopping and (possibly) while consuming. Food safety is clearly an important credence quality attribute, which is rather well understood by the consumer.

The most important cues for assessing the safety of beef (pork, chicken), as they came out of the focus groups, were used in the survey. They are listed and segregated here in this presentation for analytical purpose, but not in the questionnaire, in extrinsic and intrinsic quality cues. We asked: "How helpful or otherwise are each of the following in assessing the safety of beef (pork, chicken)?" Again, a 5-point scale was used. The cues listed in figure 2 were regarded by the consumers of each country investigated and for each meat investigated on average as helful to varying degree. In particular in the case of Germany "price" is an

exception with an average rating of "neither" for all three meats. The other exception is "name of producer" with an average rating in Sweden for chicken as not helpful. All other cues are regarded as helpful or very helpful.

To get a measure for the most important concerns, which came up in the focus groups, we asked: "How concerned or unconcerned are you personally about each of the following when buying beef (pork, chicken) nowadays?" These credence quality attributes are presented in figure 2. Again a 5-point scale has been choosen. All attributes rated on average higher than 2,0 with the exception of fat/cholesterol, which seems to be no important concern in Europe.

Regulating intrinsic cues

Intrinsic cues received while shopping are known by the consumer by inspection before quality selection. On the basis of the framework presented above, it becomes obvious that the market for quality is efficient in the sense, that complete information for quality selection exists. No informational asymmetries or other reasons for market failure prevail.[28] Regulatory intervention will decrease social welfare. This is equivalent with the results of Bocksteal.[29] She demonstrated in a two quality supply-demand model, that when consumers can perceive quality before purchase, minimum quality standards lead to social losses. Her approach is consistent with our approach here.

Other research comes to even more pronounced conclusions. In a kind of signaling model Jovanovic[30] comes to the conclucions that, if disclosure of quality is expensive, in equilibrium more than the socially optimal amount of disclosure takes place.[31] His results are driven by the assumption that misrepresentation of quality is impossible in his model. This is exactly the case for intrinsic cues for eating quality. Though the perception of the intrinsic cues may be influenced by suppliers by advertising[32], the intrinsic cues themselves can hardly be misrepresented, unless meat or other food is bought without inspection in the shop.

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[28] Accordingly the Arrow-Debreu framework could be applied with the resulting welfare theorems.

[29] Bocksteal, N.E.: The Welfare Implications of Minimum Quality Standards. In: American Journal of Agricultural Economics Vol. 66 (1984), pp.466-71.

[30] Compare Jovanovic, B.: Truthful Disclosure of Information. In: The Bell Journal of Economics Vol.13(1), 1982, pp.36-44.

[31] This results are equivalent with the results acchieved in Spence, A.M.: Job-Market Signalling. In: Quarterly Journal of Economics Vol. 87, 1973, pp.355-379 and other later literature on signalling.

[32] Here we may take the view of G.J. Stigler and G.S. Becker as put forward in their article: De Gustibus Non est Disputandum. In: The American Economic Review Vol. 67(2), March 1977, pp.76-80, that advertsing simply improves on the "appreciation" by inducing a kind of technical progress in the individual utility generating function. Another view is taken in the literature on signalling. Here advertising is regarded as one means to signal quality. This will be discussed later in detail.

Some consumers may be have better experience in predicting eating quality and use a different set of criteria in evaluating the instrinsic quality cues received while shopping. It is interesting to note, that according to our research, those people who regard themselves as being able to predict meat quality by visual inspection are significantly older (average 48 year old) than those who did not agree (average 42 year old) with the statement "You can assess the quality of beef (pork, or chicken) in the shop just by looking at it". In Germany about 30% claim to be able to assess the quality in the shop, while 60% don't. The rest answered neither. This is reversed for the other countries, where roughly 60% claim to be experts, with more than 70% in the case of Spain. In the case of chicken, less consumer claim to be able to assess the quality in the shop. Furthermore intrinsic cues are significantly more important for the "experts", in particular "colour". Significant differences between the two groups can not be observed for the importance of the extrinsic cues "brand/label", "place of purchase", "price" and "country of origin" in general. Even experienced shoppers seem to rely heavily on extrinsic cues in predicting eating quality.

"Colour" is, according to our research, the most important intrinsic cue for eating quality. In the case of Germany consumer seem to rely less on intrinsic cues than in other countries investigated. According to the research of Steenkamp and van Trijp[33] the colour of raw blade steak is used by the consumer as a predictor for eating quality, but has no correlation at all with the experienced quality. This result puts a question mark behind the claim of those consumers judging themselves as "experts". Colour seem to be overestimated in importance for predicting eating quality.

"Freshness" is the most important intrinsic cue for safety, according to our research. In the case of meat, this seems rather curious. Freshness seems to be a rather fuzzy construct, which proved to be reliable for other foods and is extended by the consumer to meat without further considerations. In the case of meat maturation period is decisive and not freshness.

Standards for intrinsic cues indicating eating quality seem to be welfare decreasing. These standards may only be justified as trade standards to reduce transaction costs.[34] With the

[33] Compare Steenkamp, J.-B. and H.van Trijp: Quality Guidance: A consumer-based approach to food quality improvement using partial least squares. In: European Review of Agricultural Economics Vol. 23 (1996), pp.195-215.

[34] Grading according to a mandatory standard which relies on visual inspection is undertaken in the carcass classification. In the case of pork this grading is mainly done mechanically, in the case of beef, efforts to make grading objective and to automatize grading are on the way. This standard can not be justified on the grounds here. This standard is a trade standard which reduces transaction costs by supplying a product description facilitating trade without visual inspection. This standard is not communicated to the consumer. This fact demonstrates rather well, that this standard can not be justified on consumer considerations. The same holds for

abandonding of the recipe or vertical harmonization approach in EU policy in the 80's and the shifting to the horizontal harmonization approach, standards on design still exist, but emphasis shifted to performance standards.

Regulating extrinsic cues for eating quality

In the case of prepacked food, brands, labels or other marks may signal quality.[35] Other means to signal quality are discussed in the economic literature. All cues for which reputation could be build up are possible signals of quality. Reputation can be regarded as the general mechanism to build up confidence without third party verification or public control. For reputation to be credible for the consumer the cost for signalling high quality by the producer has to be higher for low quality, or the benefit from signaling high quality has to be higher for the high quality producer, because of lost of reputation if low quality is offered. Furthermore the price (above cost) premium for high quality has to be higher than for low quality, to induce high quality production of eating quality. Investments in sunk cost (building up reputation) are the result.[36]

The market mechanismus to supply quality in the case of eating quality only works, if there is the possibility for high quality suppliers to build up reputation and accordingly receive a price premium. This market mechanism can work in the case of food products sold prepacked. Here brands, marks, labels etc could signal quality. Public regulation may be restricted to assure the reliability of information supplied by the high quality producer.

Labels play an important role in the market for food quality. This is covered more in detail by Caswell in her effort to link attributes and regulatory regimes together.[37] But in the case of meat and some other food products, these products are sold to a large extent not prepacked.

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the grading in the fruit and vegetables sector. It is often claimed, and exemplified with the pork grading, that the long term effects of a grading system may direct production in the wrong way by focusing on a particular, measurable indicators of quality. Further refinements of standards have successively to take care of these adverse effects of standards.

[35] On this topic, a lot of literature is available. Among the quality signals that consumers are assumed to use are: price, brand name, shop name, ingredients, country of origin, friends recommendations, consumer magazines, previous use, advertisements, guarantees and packaging. In particular price as a quality signal has found vast interest in economic theory. According to our own research results, we regard price as no important indicator for food quality in general and fresh meat quality in particular.

[36] Compare in detail Klein, B. and K. Leffler: Non governmental enforecement of contracts: the role of market forces assuring quality. In: Journal of Political Economy 1981, pp.615-41.

[37] As such, her approach is very similiar to ours, but she exclusively focuses on labelling, while we try to extend this approach to other regulatory regimes. A further distinction between our approach and the approach employed by Caswell is that our approach differentiates between extrinsic and intrinsic cues, experience and credence quality, while she uses the search- experience-, credence framework. Compare on labelling more in detail: Caswell, J.: Uses of Food Labelling Regulations. OECD Working Paper on Agricultural Policies and Markets AGR/CA/APM(97)25, 1997.

Accordingly the cues to establish a reliable signal of high quality are rather restricted. Brands and labels are of use for the consumer to predict eating quality, but they have only minor importance in the fresh meat market. The place of purchase becomes here the main signal of product quality.

In the case of meat, the consumer in general perceives the quality supplied by the butcher as more reliable than the quality sold prepacked in supermarkets. The kind of outlet (butcher or supermarket) is, according to our results, very important as quality signal used by consumers. For beef and pork, the “place of purchase” was the among the most important quality cues in all countries except in Sweden and the United Kingdom, where the market share of traditional butchers is comparatively low. For chicken, "place of purchase" is less important, because chicken is mainly bought in super- or hypermarkets.

"Country of origin" is more important in the case of Sweden, than “place of purchase”. In all other countries, except the United Kingdom, "country of origin" ranked lower (but only in some cases statistically significant) for beef and pork than "place of purchase". For chicken, "country of origin" seem to be as important as "place of purchase".

The high importance of "country of origin" for beef in particular in Ireland, Germany, Sweden, Italy, and Spain seem to reflect the BSE concerns of consumers regarding imported beef. Here safety and quality issues seem to be mixed up.

The importance attributed to the cue "country of origin" gives high support for the approach of the EU to supply the means to reliable claim "country of origin" by the traceability and labelling regulation. Two caveats have to be added.

First, "country of origin" is objectively no predictor of eating quality, as confirmed in sensoric studies.[38] An exception is Argentinian Beef. From an objective quality view a kind of "placebo effect" or "potemkin effect" may be induced with the public regulatory support underlining the importance of "country of origin".

Second, "country of origin" is a cue, which is associated with a extensive set of issues, ranging from the image of the geographical area to perceived national differences in culture

[38] Compare Gerhardy, H.: Verbraucherorientierte Rindfleischerzeugung. Habilitationsschrift zur Erlangung der Venia Legendi am Fachbereich Agrarwissenschaften der Georg-August-Universität Göttingen, July 1996.

and tradition. Consumers may associate issues with this quality cue of no relevance for eating quality.[39]

The "country of origin-" or "made in-effect" is important for differentiating products and reducing interchangeability. As such it attempts to establish a kind of national marketing brand. The results of our and other research available[40] supports the importance of the country of origin on perceived product quality. This effect could be the result of the increasing anonymity of markets and the resulting increased importance of cues. This effect is especially important in the meat sector.

At least, the effects of "country of origin" claims, as they will occur in the future as an outcome of the regulation, have to be screened to circumvent the erection of non-tariff barriers to trade between Member States of the EU by this regulation. Furthermore the public national support for advertising this cue has to be screened.

All the extrinsic cues rated rather high, with the exception of price. Price is regarded as not hepful for predicting product quality. This is in contradiction to the theoretical literature, where price as a signal for product quality has found vast attention, but supported by empirical studies available. Hanf and Wersebe, summarizing the empirical research available, come to the conclusion, that the correlation between price and quality is very weak.[41] Price seem to be an indicator for quality only for those products, where the quality is easy to inspect. This is clearly not the case for eating quality of fresh meat.

Misleading quality signals will result in a inefficient allocation. An allocation according to misleading quality information can be improved on to some extent, when further trade is possible. But in the case of food, this is clearly not the case, because it is consumed already, when the right quality is detected. Accordingly here regulators have a particular responsibility to take care of consumer deception.

Regulators assist the market by supplying voluntary definitional standards, like for organic product, free range, animal welfare etc. These standards are based on conventions, found in

[39] Compare the papers presented at the workshop: "Consumer Preferences for Products of the Own Region/Country and Consequences for the Food Marketing" of the AIR-CAT project: "Measurements of Consumer Attitudes and their Influence on Food Choice and Acceptability" published as Vol.4 No. 3 in the series of meeting reports, 1998.

[40] Liefeld, J.P.: Experiments on Country-of-Origin Effects: Review and Meta-Analyses of Effect-Size. In: Papadopoulos, N.G. and Heslop, L.A.(ed.): Product-Country Images: Impact and Role in International Marketing. New York, London, Norwood 1993, pp. 117-156.

the political arena and not on the market, though conventions, as already established on the market are picked up. It is well documented in figure 1 that on the EU level a lot of efforts in this direction have been undertaken already. According to our framework, these definitional standards can be justified only on the grounds of prevention of consumer deception.

In particular for not prepacked foods, like meat, the backing up of the market by the supply of voluntary definitional standards seems to be promising way to increase consumer perceived quality. Furthermore regulators have to control the credibility of extrinsic claims, like feed, name of producer etc. The traceability regulation for beef could be interpreted as an effort in this direction, though the original intention was targeted towards food safety. As such, the traceability regulation for beef can give an example for other not prepacked foods in particular and food in general.

The European Quality Beef scheme (EQB-scheme) is here another example of a regulatory effort to back up the private effort to establish a eating quality mark. The definitional standard of quality, agreed on in this scheme, has evolved. This definitional standard is further supported by EU financial contributing to the private cost of promotion and advertising. This financial support is not justified within the framework employed here. It may only be justified on budgetary considerations in the sense, that domestic product promotion may be a less expensive means to get rid of overproduction, than subsidizing exports.

Regulating extrinsic cues for credence quality: process quality concerns

We distinguish between food safety and health concerns and "mere" quality concerns. Consumers demand to an increasing extent those quality attributes, which we call "rest of credence quality". Process characteristics are included in this category and are becoming more and more of importance for the consumer.

While food safety and health concerns are clearly an issue to be addressed by policy makers, process quality seems to be of minor importance in this respect. Consumers asking for specific characteristics of the production process have to rely on the truthfulness of the claims of the seller. Furthermore regulators may supply the market with voluntary definitional standards, but no further regulatory effort seems to be needed.

[41] Compare Hanf C.-H.and B.von Wersebe: Price, Quality, and Consumers' Behaviour. In: Journal of Consumer Policy Vol.17 (1994), pp.335-348.

Definitions of standards have to be understood by the consumer, to be communicated successfully. In the case of unproveable credence quality attribute cues a paricular responsiblility.

The possible quality erosion for credence attributes is clearly more severe than in the case of experience quality. [42] While in the later case the quality becomes obvious after consumption, this is not the case for credence quality. Accordingly policy makers have here a higher responsibility to avoid consumer deception on these issues.

Credence quality attributes may be communicated in general like experience quality attributes with cues indicating certain characteristics of the product. But in the case of credence quality, these claims are not provable by the consumer. Truthfulness as backed up by third party control seems to be of particular importance here.

Consumers may have different preferences for eating quality and accordingly for rest of credence quality attributes. There seems to be no justification to introduce mandatory standards in the former or in the later case.

According to our research results, it should be one of the main tasks for public policy, to contribute to the better understanding of objective quality and to the convergence of objective and perceived quality. Cues available for judging the credence quality of fresh meat are sparse. Accordingly consumers seem to mix up safety and quality concerns. "Country of origin" is both, important as a cue for eating quality and for safety.

Organic, not addressed in our research due to the minor importance for fresh meat, is another cue with a loading on several dimensions. Safety and quality, ethical and environmental, political and other issues are mixed together in the understanding of this standard by the consumer. Policy makers should contribute to a refinement of consumer understanding on these issues, and not contribute to a coarsening of the attribute set. Regulations should clearly seperate between these issues, otherwise consumer deception is luring at the horizon.

Extrinsic cues should be defined by the market to take care of consumer needs or backed up by voluntary definitional standards, as supplied by regulators. These cues should clearly differentiate between eating and food safety and rest of quality concerns. These concepts

[42] Comapare Becker, T.: Quality Policy and Consumer Behaviour. In: Schiefer, G. and R. Helbig: Quality Management and Process Improvement for Competitive Advantage in Agriculture and Food. Vol.1. Proceedings of the 49th Seminar of the European Association of Agricultural Economists (EAAE), February 19-21, 1997, Bonn, Gernany.

should not be mixed up in cue communication. If quality attribute bundling is profitable, the market will find the otimal solution as long as the quality attributes are understood and known by the consumer. Quality attribute bundling in public standardization policy seems to be questionable. The market seems to be a better instrument not only to regulate quality supply, as long as the quality is open to inspection, but as well to find the optimal quality bundling of inspection quality.

Consumers should define standards meeting their needs, not interest groups. Policy making should not only contribute to a better understanding of the consumer of the content, scope and nature of the standard. Even more important, standards should adress one issue at a time, either eating quality, or health concerns, or food safety issues, or "rest of credence quality". One very clear result of our research is, that for fresh meat the same cues are used as indicators for eating and credence quality. For successful feeding back of consumer needs into the supply chain, these issues should be clearly seperated.

Regulating extrinsic cues for credence quality: health concerns

Nutritional labelling is regulated in the EU such, that it is only mandatory, if nutritional claims are made and for dietary food product. Health concerns are not addressed to the extent as in the US. Here nutritional labelling is mandatory for prepacked food products in general. The design of nutrition content labeling is discussed extensively by Ippolito and Mathios.[43] Food labels do not serve exclusively as a direct shopping aid. Food labels have a significant product design influence. Label regulations establish parameters for advertising, in effect creating and limiting the franchise to advertise. Labels act as a public surveillance assurance. This third party rule of food labels especially seems to be important. Last but not least, labels depict the public definition of values and act as a forum for consensus.[44]

While health claims are still ruled out by law in most if not all countries of the EU, the experience of the change in the U.S. regulation policy in 1985 is of special help for regulatory design. In 1985 the prohibition of diet-disease claims was relaxed, after being challenged by the Kellogg Company in 1984. The regulatory change allowed producers to discuss the relationships between diet and disease in advertising and labelling subject to a general deception standard. This regulatory change led to significant improvements in food choices.

[43] Ippolito, P.M. and A.D. Mathios: New Food Labeling Regulations and the Flow of Nutrition Information to Consumers. In: Journal of Public Policy and Marketing Vol. 12 (1993), pp. 188-205.
[44] Caswell, J.A. and D.I. Padberg: Towards a More Comprehensive Theory of Food Labels. In: American Journal of Agricultural Economics Vol. 74 (1992), pp.460-68.

Policy allowing truthful producer claims appears to have added information to the market, leading to a more rapid and more consistent rate of improvements in diets.[45] Especially important for regulatory policy is the content and method of information disclosure. Here the U.S. policy again gives a good example. After a chaotic, deregulatory period in advertising and health claims, U.S. regulatory policy switched to an understanding that the government should preclear all label claims involving nutrition. The government has to take into account the scientific understanding of the influence of diet on health in this approval process. Government acts as a third party in a market with asymmetric information.[46] This asymmetric information is of especial importance to the meat market as the numerous efforts at cooperative labelling show. The U.S. experience shows that policies governing producers' use of health claims should be evaluated not only on how well they control deceptive or misleading claims, but also on how well they encourage producers to disseminate evolving health information to consumers.[47]

The experience of the US may give an example for the future development of EU policy in this area. The nutritional labelling seems in particular promising. For fresh meat this approach seems to be of minor importance to establish consumer confidence.

According to our research results, the health concern fat/cholesterol seem to play a minor role for European consumers. Of all credence attributes asked for, this attribute is rated lowest by the European consumer. It is an open question, whether this indicates a more objective and scientifically proved view than in the US or vice versa.

Regulating extrinsic cues for credence quality: food safety concerns.

In nearly all countries investigated consumers are very concerned for beef about BSE, hormones, antibiotics and to a lesser extent about salmonella. For pork, the concerns about hormones, antibiotics and salmonella rate similiar. In the case of chicken, the concern about salmonella is dominating.

[45] Ippolito, P.M. and A.D. Mathios: Nutrition Information and Policy: A Study of U.S. Food Production Trends. March 1994. Manuscript of an article to appear in Journal of Consumer Policy.
[46] Caswell, J.A. and D.I. Padberg: Towards a More Comprehensive Theory of Food Labels. In: American Journal of Agricultural Economics Vol. 74 (1992), pp.460-68.
[47] Ippolito, P.M. and A.D. Mathios: Health Claims in Food Marketing: Evidence on Knowledge and Behavior in the Cereal Market. Journal of Public Policy and Marketing Vol. 10 (1991) pp. 15-32.

The intrisic cue "freshness" is of most important for all meats and all countries. Feed comes next in the case of beef, feed and origin in the case of pork and free range and feed in the case of chicken. Price is not important at all as a safety indicator.

Feed seems to be the most promising cue for adressing food safety concerns. Accordingly the suppliers act rational, if they try to communicate this cue to the consumer. Public regulations may back up this approach by defining different feeding regimes more in detail.

But standards by measurement are dominating in the area of food safety. In the last decade the emphasis shifted from regulating the product to regulating the process. These regulatory efforts, like the Hazard Analysis and Crtitical Control Point approach are not directly communicated to the consumer.

Taking into account the boundedness of consumer information processing capacities, it seems to be not a promising approach to introduce cues for food safety. Food safety is a too complex and too serious issue, to have each consumer to judge on this issue. Here regulatory control has to take care of the supply of safe food.

Furthermore, regarding the death risk at stake, it could be argued, that the supply of food safety is an obligation to regulators. It is clearly not the case, that our food is safe. The deaths according to Salmonella infection count in the thousends, while the death due to BSE count in the tens. It is well known, that those risks, which are familiar to consumers, tend to be underestimated, while those risks, which are new, tend to be overestimated. This is clearly an issue which deserves more attention.

Food safety standards are complicated to judge without expertise. Therefore, from the information view, on wich our framework is based, it seems no promising way to establish consumer confidence by introducing food safety cues.

THE ECONOMICS OF FOOD QUALITY STANDARDS

Prof. Dr. Tilman Becker

University of Hohenheim

Institute for Agricultural Policy and Markets

Germany

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This paper covers very shortly some of the results of a larger research effort. More details are available in six country reports on national consumer behaviour, six country reports on national quality policy, a summary report on consumer behaviour, a summary report on quality policy and a final report linking both parts together. These reports can be downloaded from the project homepage http://www.uni-hohenheim.de/~apo420b. The project has been founded as FAIR CT95-0046 within the 4. Framework Programme of the European Commission. The project title is "Quality Policy and Consumer Behaviour". The financial contribution of the Commission is acknowledged. The views taken here are the views of the author and do not neccessarily reflect the position of the European Commission.

APPENDIX

Figure 1: Average Ratings of Extrinsic and Intrinsic Cues for Predicting Eating Quality Beef

Fehler! Keine gültige Verknüpfung.

Figure 2: Average Ratings of Extrinsic and Intrinsic Cues for Predicting Eating Quality Pork

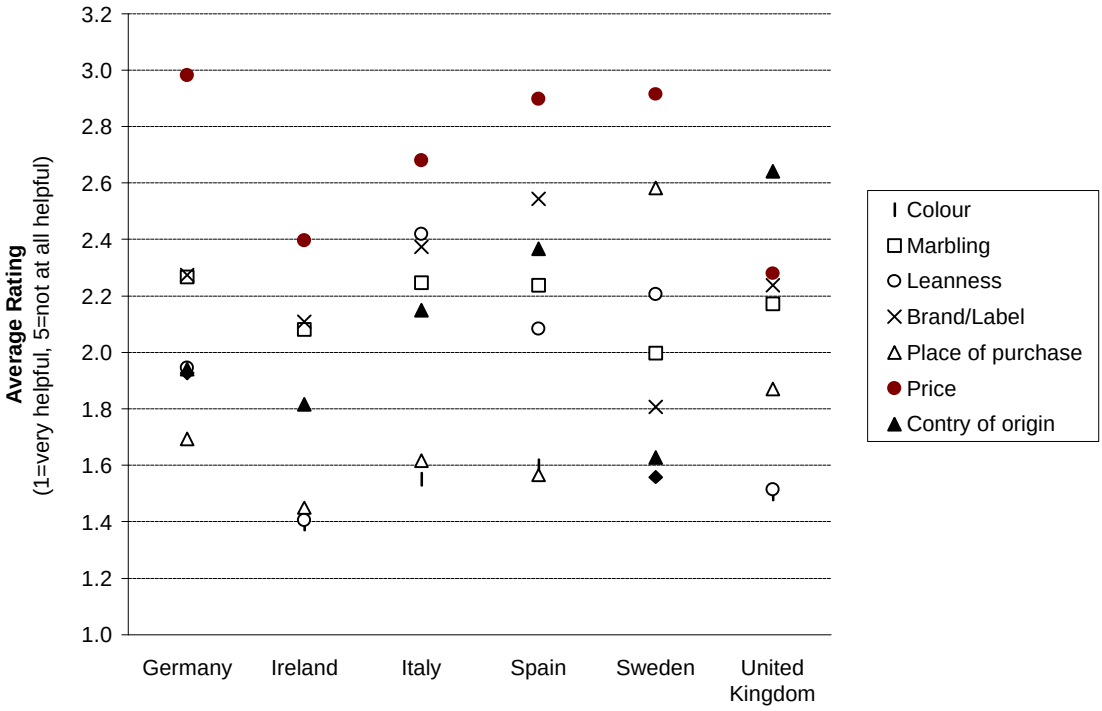

Figure 3: Average Ratings of Extrinsic and Intrinsic Cues for Predicting Eating Quality Chicken

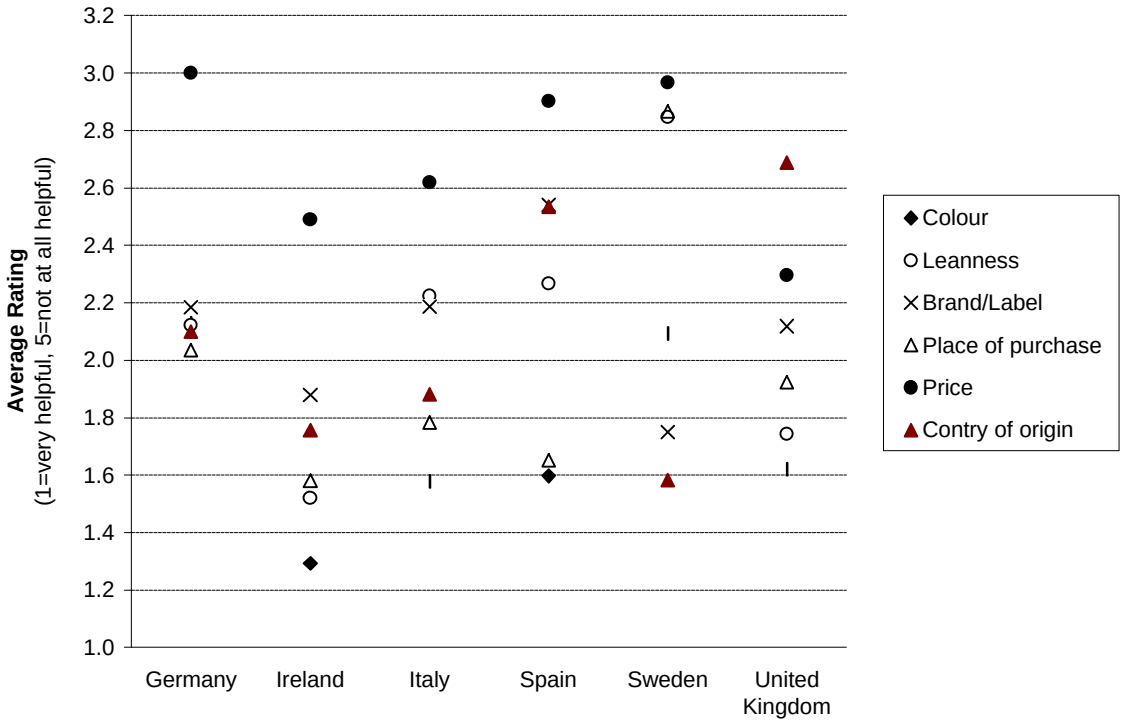

Figure 4: Average Ratings of Eating Quality Attributes - Beef

Fehler! Keine gültige Verknüpfung.

Figure 5: Average Ratings of Eating Quality Attributes - Pork

Fehler! Keine gültige Verknüpfung.

Figure 6: Average Ratings of Eating Quality Attributes - Chicken

Fehler! Keine gültige Verknüpfung.

Table 1: Significant Differences in the Helpfulness of Cues for Eating Quality' Results of a t-Test

	Germany	Ireland	Italy	Spain	Sweden	United Kingdom
BEEF						
1st rank	origin, place	colour, place, leanness, origin	Colour, place	place, colour	colour, origin, label	colour, leanness
2nd rank	leanness, colour	marbling, label	Origin	leanness, origin, marbling, label	Marbling	place, marbling, label
3rd rank	marbling, label	price	Marbling, label, leanness	price	Leanness	price, origin
4th rank	price		price		place, price	
PORK						
1st rank	place,	colour, leanness, place	Colour, place	colour, place	colour, origin	colour, leanness
2nd rank	origin, colour, leanness	origin	Origin, marbling, label, leanness	leanness, marbling, label, origin	label	place
3rd rank	label, marbling	label, marbling	price	price	Marbling	marbling, label, price
4th rank	price	price			Leanness	origin
5th rank					place	
6th rank					price	
CHICKEN						
1st rank	place, origin, leanness, colour, label	colour	Colour	colour, place	origin	colour
2nd rank	price	leanness, place	Place, origin	leanness	label	leanness
3rd rank		origin, label	Leanness, label	label, origin	colour	place, label
4th rank		price	price	price	price, leanness, place	price
5th rank						origin

Table 2: Significant Differences in the Importance of 'Eating Quality ' Attributes Results of a t-Test

	Germany	Ireland	Italy	Spain	Sweden	United Kingdom
BEEF						
1st rank	tenderness, juiciness, flavour, smell	tenderness, flavour	flavour	flavour, tenderness, juiciness	flavour	flavour, tenderness, gristle, texture, colour, juiciness, smell, leanness
2nd rank	colour, gristle, texture	colour, leanness, juiciness, texture, gristle, smell	Tenderness, juiciness, smell, colour, texture	colour, smell	tenderness	
3rd rank	leanness		Leanness, gristle	texture	juiciness, smell, texture, gristle	
4th rank				leanness	colour	
5th rank				gristle	leanness	
PORK						
1st rank	flavour, tenderness, juiciness, smell	flavour, tenderness	flavour	smell, flavour, tenderness, juiciness, colour	flavour	flavour, tenderness, gristle, smell, texture, colour, leanness, juiciness
2nd rank	colour, texture, gristle, leanness	leanness, texture, colour, smell, gristle, juiciness	Tenderness, texture, smell, juiciness, colour	texture	tenderness, juiciness, smell, texture	
3rd rank			Leanness, gristle	leanness	colour, gristle	
4th rank				gristle	leanness	

Table 2 continued:

CHICKEN						
1st rank	Flavour, smell, tenderness, juiciness	flavour, tenderness, smell, colour, texture, leanness, gristle, juiciness	flavour	flavour, smell, juiciness, colour, tenderness	flavour	flavour
2nd rank	Colour, leanness		smell, texture, colour, tenderness, juiciness	texture	smell, tenderness, juiciness, texture	tenderness
3rd rank	Texture, gristle		leanness	leanness	Colour	smell, gristle, texture, colour, leanness, juiciness
4th rank			gristle	gristle	Gristle	
5th rank					Leanness	

Figure 7: Average Ratings of Safety Cues - Beef

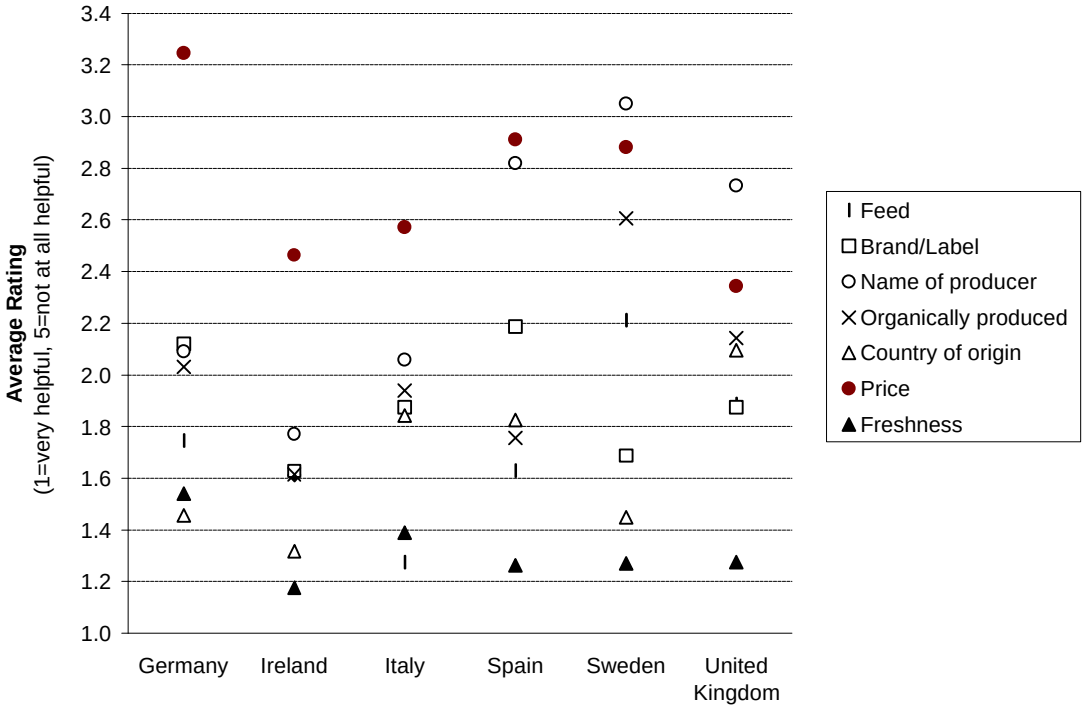

Figure 8: Average Ratings of Safety Cues - Pork

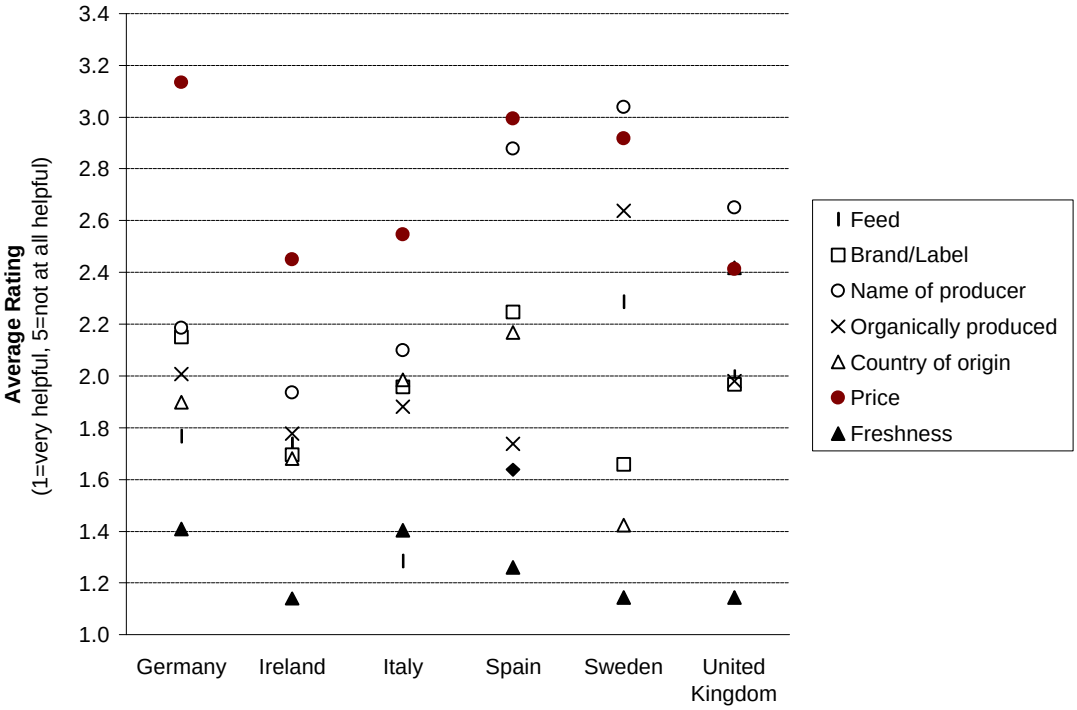

Figure 9: Average Ratings of Safety Cues - Chicken

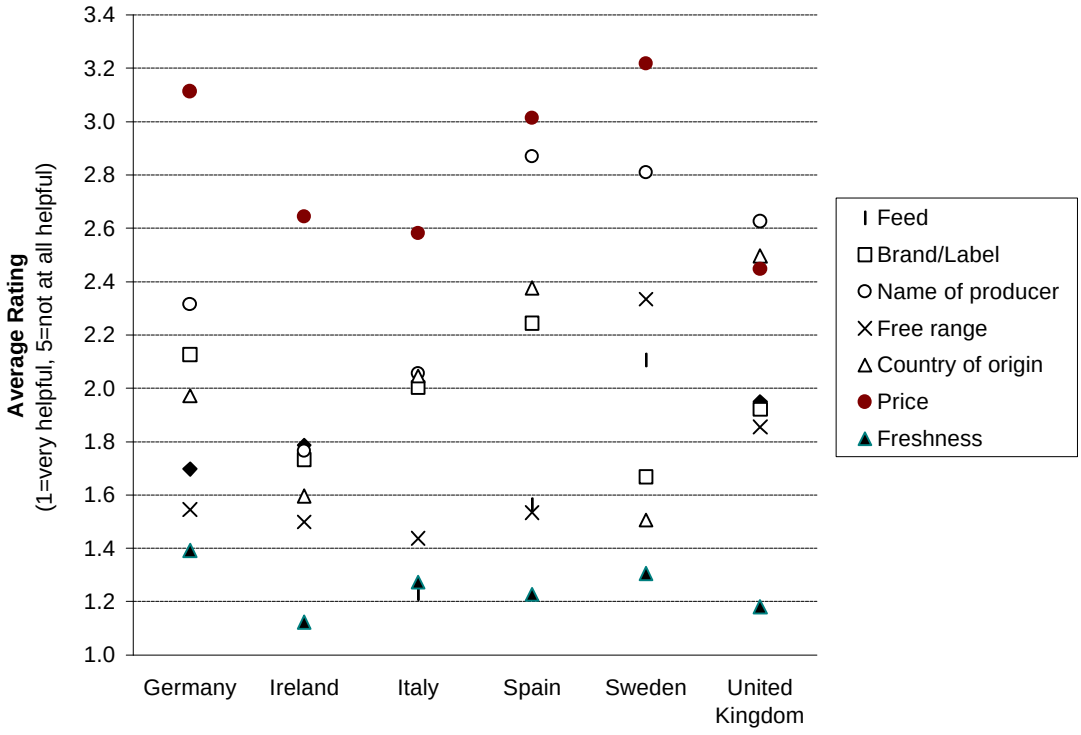

Table 3: Significant Differences in the Helpfulness of 'Safety Cues' Results of a t-Test

	Germany	Ireland	Italy	Spain	Sweden	United Kingdom
BEEF						
1st rank	origin, freshness	freshness	feed	freshness	freshness	Freshness
2nd rank	feed	origin	freshness	feed, organic, origin	origin	Label, feed
3rd rank	organic, producer, label	feed, organic, label	origin, label organic producer	label	label	Origin, organic
4th rank	price	producer	price	producer, price	feed	Price
5th rank		price			organic	Producer
6th rank					price, producer	
PORK						
1st rank	freshness	freshness	feed, freshness	freshness	freshness	Freshness
2nd rank	feed, origin, organic, label, producer	origin, label, feed, organic	organic, label, origin, producer	feed, organic	origin	Label, organic, feed
3rd rank	price	producer	price	origin, label	label	Price, origin
4th rank		price		producer, price	feed	Producer
5th rank					organic	
6th rank					price, producer	
CHICKEN						
1st rank	freshness	freshness	feed, freshness	freshness	freshness	Freshness
2nd rank	free range	free range, origin	free range	free range, feed	origin	free range, label, feed
3rd rank	feed	label, producer, feed	label, origin, producer	label, origin	label	Price, origin
4th rank	origin	price	price	producer, price	feed	Producer
5th rank	label				free range	
6th rank	producer				producer	
7th rank	price				price	

Figure 10: Average Ratings of Concerns - Beef

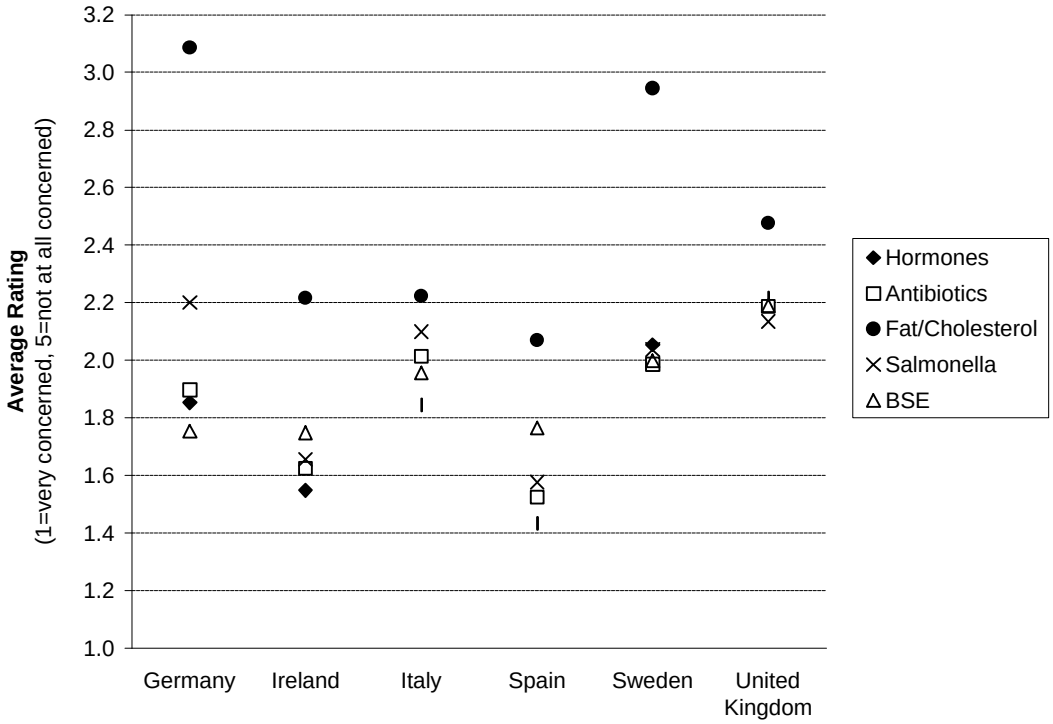

Figure 11: Average Ratings of Concerns - Pork

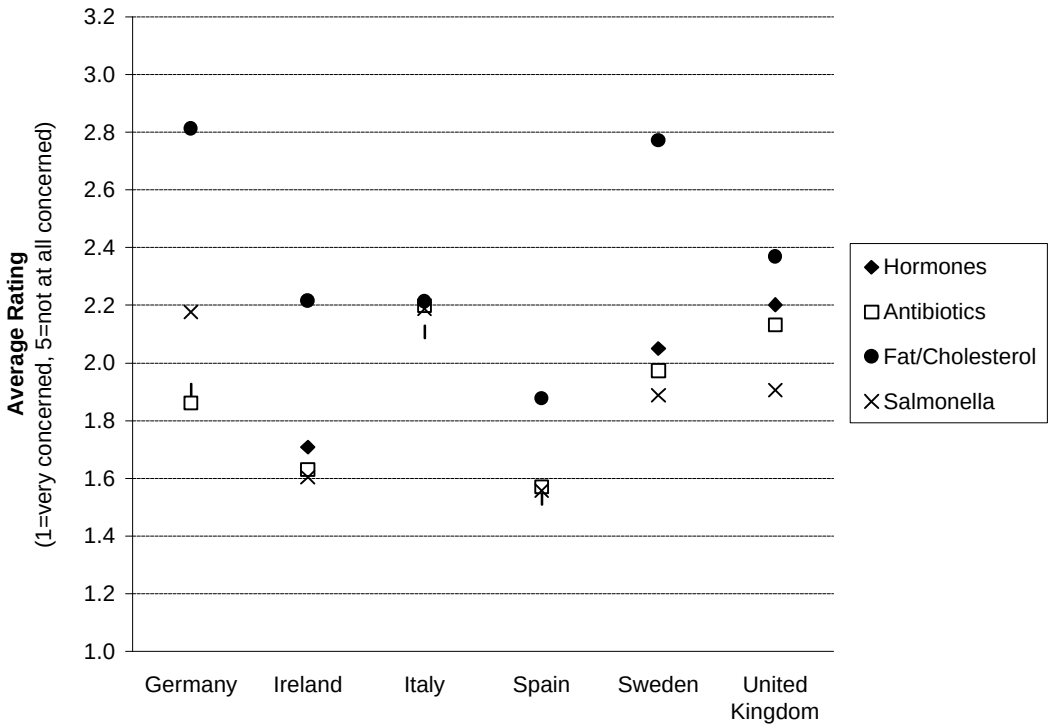

Figure 12: Average Ratings of Concerns - Chicken

Fehler! Keine gültige Verknüpfung.

Table 4: Significant Differences in Concerns About Meat - Results of a t-Test

	Germany	Ireland	Italy	Spain	Sweden	United Kingdom
BEEF						
1st rank	BSE, hormones, antibiotics	hormones, antibiotics, salmonella, BSE	hormones, BSE, antibiotics, salmonella	hormones	antibiotics, BSE, salmonella, hormones	salmonella, antibiotics, BSE, hormones
2nd rank	Salmonella	fat/cholesterol	fat/cholesterol	antibiotics, salmonella	fat/cholesterol	fat/cholesterol
3rd rank	fat/cholesterol			BSE		
4th rank				fat/cholesterol		
PORK						
1st rank	Antibiotics, hormones	salmonella, antibiotics, hormones	hormones, salmonella, antibiotics, fat/cholesterol	hormones, salmonella, antibiotics	salmonella, antibiotics, hormones	salmonella
2nd rank	Salmonella	fat/cholesterol		fat/cholesterol	fat/cholesterol	antibiotics, hormones, fat/cholesterol
3rd rank	fat/cholesterol					
CHICKEN						
1st rank	Salmonella	salmonella	hormones, salmonella, antibiotics	hormones, salmonella	salmonella	salmonella
2nd rank	Hormones, antibiotics	antibiotics	fat/cholesterol	antibiotics	antibiotics	antibiotics, hormones
3rd rank	fat/cholesterol	hormones		fat/cholesterol	hormones	fat/cholesterol
4th rank		fat/cholesterol			fat/cholesterol	

Source: Becker, T., E. Benner and K. Glitsch: Summary Report on Consumer Behaviour Towards Meat in Germany, Ireland, Italy, Spain, Sweden and The United Kingdom -Results of a Consumer Survey-.