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TRADING "ETHICAL PREFERENCES" IN THE MARKET: OUTLINE OF A POLITICALLY LIBERAL FRAMEWORK FOR THE ETHICAL CHARACTERIZATION OF FOODS

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ABSTRACT. The absence of appropriate information about imperceptible and ethical food characteristics limits the opportunities for concerned consumer/citizens to take ethical issues into account during their inescapable food consumption. It also fuels trust crises between producers and consumers, hinders the optimal embedment of innovative technologies, "punishes" in the market ethical producers, and limits the opportunities for politically liberal democratic governance. This paper outlines a framework for the ethical characterization and subsequent optimization of foods (ECHO). The framework applies to "imperceptible," "pragmatic," and "reasonable" food characteristics about which consumers/citizens maintain concerns. A political perspective is assumed in that valid information is taken to serve the politically liberal and democratic functions of the market by allowing concerned citizens to make informed choices in their role as food consumers. Information is aggregated by multi-attribute modeling. It takes the form of "maximized" ("utilitarian") to "most balanced" (MINMAX) non-binary aggregate comparative rankings of perceptibly substitutable food products. The model requires the description of characteristics by means of criteria and weights (structural input), and technical input on the performance of food for these criteria (product input). Structural input is grounded on relevantly concerned citizen/consumers' perceptions. It is culture and times dependent. Availability of product input is assumed. Uses for the amelioration of the aforementioned limitations are discussed. So long as, and to the extent that, certain ethical concerns are not addressed by public policy, the ECHO framework may facilitate offering members of society a necessary (though not a sufficient) condition for regulating the ethical aspects of food production in self-regulated markets as consumers, when they are constrained to do so through their government as citizens. In doing that, the framework may contribute to the development of the ethical dimension of food production and may bring rewards for food supply actors that take reasonable concerns of citizen/consumers into account.

KEY WORDS: Consumer concerns, ethical assessment, food labeling, market democracy, political liberalism

1. INTRODUCTION

Following the introduction of ''modern consumer theory'' by Lancaster (1966, 1971), marketed products can be seen as ''bundles'' of technical characteristics over which people have subjective individual preferences. When consumers enter the market, they are seen to realize tradeoffs between characteristics, and to choose bundles that yield optimal utility or satisfaction of their preferences. For preferences to be considered during market choices it is necessary that consumers can distinguish marketed products in terms of the corresponding characteristics. For food products, this is possible for (a) readily perceptible characteristics (like food color, shape, selling location, price, etc.), and (b) for characteristics that have been perceived in past experience (e.g., taste, aroma, texture, cooking behavior, etc.). It so happens however, that consumers nowadays also appear to be concerned (or to have ''preferences'' in this sense) about food characteristics that cannot be assessed either on the basis of their appearance or of past experience. Herein, these characteristics are referred to as ''*imperceptible*'' (also referred to in the literature as ''intrinsic'' or ''unobservable''). Preferences for imperceptible characteristics may refer, for example, to levels of environmental impact, health properties of food, fairness, or naturalness of production.[1] The consideration of this kind of preferences in the market requires the availability of appropriate information on imperceptible food characteristics.[2]

The purpose of this paper is the presentation of a conceptual framework for the ethical characterization and subsequent optimization of food products (ECHO, Figure 1). The direct purpose of the framework is to produce information that can be useful to concerned citizens wishing to make informed choices as consumers in the market, and also beneficial to actors[3] in

[1] Preferences for such characteristics are referred to in the literature as ''ethical-'' or ''consumer concerns.'' Their expression in the market has been termed ''ethical'' or ''political'' consumerism. Consumer concerns relate to consumer trust crises in the food market (Brom, 2000). They ''transcend the consumer vs. citizen dichotomy'' (Korthals, 2001a, b).

[2] In local markets, certain information has always been available. Also, information on certain imperceptible characteristics has nowadays been legally enforced (e.g., origin of production, nutritional content, the existence of genetically engineered material above certain levels). For other characteristics information is generally available only for a limited range of foods. It takes the form of values-based (Barham, 2002) voluntary certification labels (e.g., EKO, Biological, FairTrade, etc.), or of voluntary commitment to certain ''ethical standards'' (codes of conduct) by so termed ''socially responsible producers.''

[3] Depending on the food product, the generated information might be relevant to a range of actors in the supply side of the food chain (like breeders, farmers, processors, etc). Relevant actors will have to be identified on the basis of specific applications of the framework. For the purposes of this paper, all relevant actors in the supply side of the food chain will be collectively referred to as ''producers.''

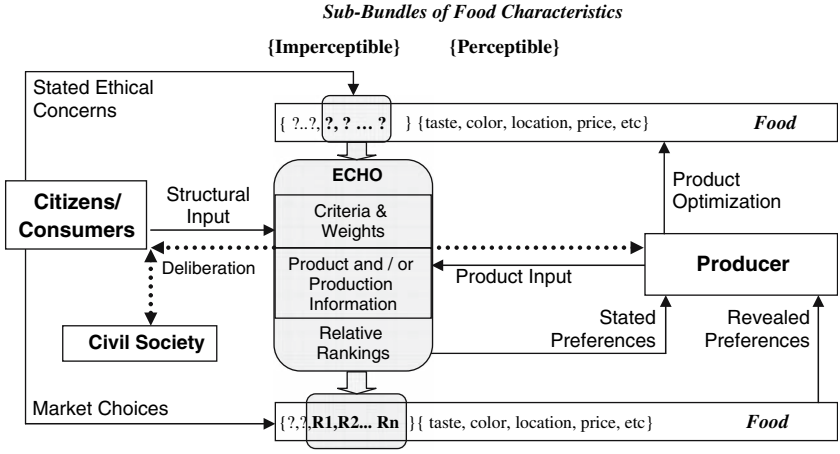

Fig. 1. The ECHO Framework: *Food* is disaggregated in sub-bundles of characteristics. Arrows represent information flows. The ECHO model ranks product *Food* for n stated ethical consumers concerns about imperceptible characteristics (R1, R2 ... Rn). Rankings are relative to substitutes. Citizens/consumers provide structural input in deliberation with producers and civil society actors. Producer provides product input and receives feedback. (a) Rankings not available to citizens/consumers: Feedback is assessment of *Food* based on stated consumer preferences. (b) Rankings available to citizens/consumers: Feedback is revealed preferences based on market choices. Producer uses feedback to optimize production

the supply side of the food chain that wish to take citizens/consumers' concerns into consideration. To be fit for communication to concerned citizens/consumers, generated information must be concise and meaningful.[4] The framework addresses these issues by producing aggregated information that refers to citizen/consumers' perceptions (herein referred to as "*characterization*"). Characterization takes the form of contextually valid comparative rankings of perceptibly substitutable food products. Rankings refer to qualified imperceptible food characteristics that correspond to citizen/consumer concerns. A multiple criteria modeling methodology is proposed for the generation of the rankings (ECHO Model). The extended

[4] "[…T]he broad aim of the review [of the current EU labeling legislation] is to find a sensible and practical balance between the polarized positions: requests for more information on labels, and the need to have clear and meaningful labels, which are easily understood by consumers." Head of Cabinet for Health and Consumer Protection addressing conference on Ethical Traceability (Schinas, 2006).

mathematical presentation of the proposed model falls outside the focus of the present paper and relevant references are provided. The model aggregates technical information on product properties and its production history (''*product input*'') to assess the performance of foods for each characteristic. The availability of product input is assumed.[5]

The framework produces information intended to facilitate the well-functioning of the market. The paper assumes a political viewpoint in that the well-functioning of the market is taken to require that the market performs the operations anticipated by the particular political context within which the market operates. A neoclassical food market operating within a model ''politically liberal market democracy'' is chosen for this purpose. To be both economically and politically consistent in our argument, the well-known distinctions between ''consumers'' and ''citizens,''[6] and between

[5] The purpose of this paper is to discuss a method for the generation of concise and meaningful information, and its uses, and not to provide a balanced argument for gathering information (or for communicating them to citizens/consumers). Therefore information costs are not discussed. Product input can be sought on an ad hoc basis from food experts and producers, or can be generated through a credible and trustworthy ''ethical traceability'' monitoring system. A European project on ''ethical traceability'' is currently in its culmination phase (EU, 2003). Traceability consists in ''being able to prove the history, the use and the localization of an entity by means of recorded identification'' (ISO 8402). To reduce requirements for product input, the model may be applied only for selected products (e.g., tomatoes, etc.), or only for selected characteristics of concern to citizens/consumers (e.g., animal welfare, etc.).

[6] The distinction between ''consumers'' and ''citizens'' is not introduced because, in the assumed political environment, consumption activity can have a structural political function: to optimize the (allocation of resources for the) supply of goods that are not regulated by the state (see also footnote 1). Herein, ''citizens/consumers'' must be understood as citizens of contemporary politically liberal democracies who may expect to take reasonable ''political'' or ''ethical'' concerns into account during their inescapable food purchase for subsistence. Citizens/consumers may (or may not) consider these concerns in the market alongside cultural and eudemonic motivations. The market choices of citizens/consumers are subject to ''consumption constraints'' (discussed at footnote 8). Throughout this paper, we refer to an optimization of production that considers the ethical preferences of citizens/consumers as ''ethical optimization of production'' (or, more precisely, as ''CPR'' optimization: see Section 2.2).

"values" and "preferences" (or "wants") are not introduced.[7] In a liberal environment, roughly, the market can be taken to operate as a dynamic mechanism for the optimization of the supply of goods about which citizens are concerned, when these goods are not regulated by the state. In the assumed political and economic environment, citizens/consumers can be understood as vectors of concerns about goods that are important to existing views of the good life. *Concerned* citizens/consumers are taken to represent those views of the good life that are not served by the status quo of mainstream food production. Herein, information is regarded to be valid when it allows concerned citizens to make market choices on goods that they perceive to be important to their own private lives, and to their relation with others (i.e., people, animals, environment, future generations, nature, etc.). To establish a link between political and neoclassical economic terminology, it is possible to reformulate the previous statement by saying that valid information must allow "*consumers*" to optimize in the market the satisfaction of their "*ethical preferences.*"

It must be stressed that this work does not suggest the market as the appropriate (or as an inappropriate) arena for the regulation of the supply of any goods of concern to citizens. Therefore, advantages and limitations of optimizing ethical aspects of production through market self-regulation are

[7] To preserve the economic clarity of the argument, the term "preference" is used in a neoclassical sense. The common (in ethics) distinction between sources of motivation based on "values," and on "mere preferences" or "wants" is not introduced. Although citizens may have "values," while consumers may simply have "wants," we take both to refer to, broadly perceived, "goods." We take citizens and consumers, owing to their own motivations, to have "preferences" about these goods. We take that in neoclassical markets citizens/consumers' preferences are accepted as they are "revealed," without further appraisal of the underlying motivations. Herein, appraisal of these motivations would be irrelevant either on political grounds (so long as e.g., hedonism is a reasonable view of the good life), or on market grounds (so long as purchases of goods motivated by "wants" do affect the allocation of scarce resources). Instead, when the aforementioned distinction must be referred to, then the term "ethical" is used to identify preferences that stem from desires which can be described as parts of "reasonable comprehensive doctrines of the good life" (Rawls, 1996, pp. 58–59; the term "ethical" is further discussed in Section 2.2). It needs to be stressed, though, that to approach herein citizens' concerns as consumer preferences is not to suggest that citizens' concerns are appropriately to be addressed to the market (and that they should therefore absent from political debate or be irrelevant to public policy). To advocate this position would imply that one's ability to address some concerns is only to be relative to one's income (like when increased prices are implied), or that some concerns are not to be addressed at all (like calls for the proscription of animal production); and that is besides the point of this paper. Rather, to perceive herein citizens' concerns as consumer preferences is to assume that there are *prima facie* reasons to turn one's attention to the solutions that can be offered by the market when the state appears to be either unwilling (e.g., for normative reasons relating to a commitment to neutrality of intent) or unable (e.g., for practical reasons relating to international-agreements-bounded food policies, or to enforceability, to reduction of bureaucracy and to increase of efficiency) to effectuate policies that meet the democratic and the politically liberal expectations of the citizenry.

not assessed in this paper. Rather, this work is concerned with the generation of information that is required if citizens are allowed to express concerns in the market when state regulation is, as a matter of fact or of norm, constrained (Michalopoulos, 2006). That is, this work aims to contribute[8] to allowing the members of society to regulate the ethical aspects of food production in real markets as consumers, when they are constrained to do so through their government as citizens.

In the sections that follow, the function of the ECHO model is outlined. Differences to other approaches are highlighted. The function of the framework for product optimization that takes into account the ethical preferences of consumers is discussed. A range of uses for food producers, consumers, their relation, the optimal use of innovative technologies in food production, and for the liberal and democratic governance of market societies is presented. It is argued that the produced information may improve communication between the supply and the demand sides of the food chain. Improved communication on ethical issues may encourage actors in the supply side of the chain in considering the ethical aspects of their production. We refer to this as the development of the "ethical dimension" of the (food) market.

2. THE ECHO MODEL

2.1. *Function of the Model*

The ECHO model aggregates technical information to characterize foods' performance for imperceptible characteristics that refer to existing ethical citizen/consumers' concerns (Figure 2). Characterizations are comparative rankings of foods that can be considered as close substitutes in terms of perceptible characteristics (food "*options*"). Characterization happens on the basis of technical criteria that refer to stated citizen/consumer concerns, and according to weights that refer to citizen/consumer perceptions. First, the model is provided with a description of each characteristic in terms of measurable weighted criteria and preference scales (*structural input*). Next, the model is provided with technical information about the actual performance of food options for each of these criteria (*product input*). Product input is used to assess the performance of each option for each criterion on

[8] This work targets a necessary though not sufficient condition for the justification of market self-regulation in politically liberal market democracies: that of the "information" part of "informed choice." We are aware that the communication of appropriate information does not suffice for achieving market democratization. Other necessary conditions (which are not addressed by the framework) will be collectively referred to as "consumption constraints." Consumption constraints may refer to income and purchasing power inequalities, to imperfect competition, to bounded rationality, etc.

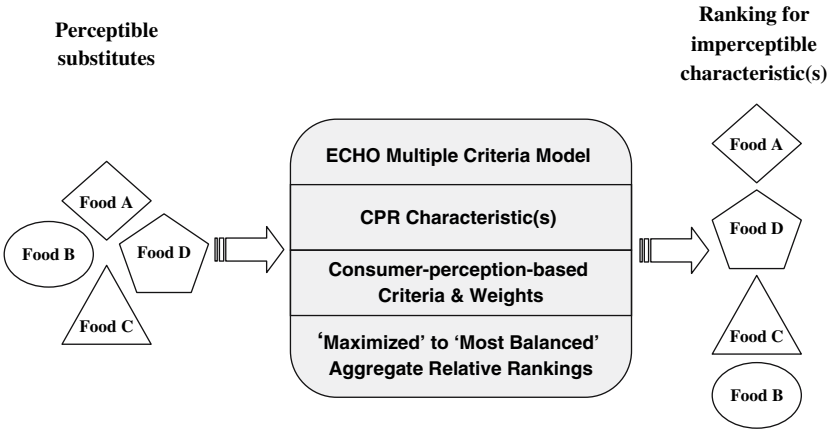

Fig. 2. Function of the ECHO Model. The multiple-criteria model ranks seemingly (perceptibly) substitute products for "credence," "pragmatic," and "reasonable" food characteristics (CPR). Criteria and relative weights used to describe characteristics are based on citizen/consumer perceptions. Produced rankings range from "maximized" to "most balanced".

preference scales, and its availability is herein assumed. Structural input is used to aggregate product input and to rank food options for each characteristic. A multi-attribute method is referred to for this purpose.[9] Mathematically, a final step is possible for the overall aggregation of the performances of a food option for different characteristics.

The ethical characterization of food is approached as a multiple criteria problem. Multiple criteria approaches can facilitate "economic" decision making,[10] and are not unusual to assessments of ethical aspects of food production (e.g., Rigby et al., 2001; Diaz-Balteiro and Romero, 2004; van Calker et al., 2005). Reasons for this might range from the sheer complexity of such problems (e.g., different aspects of sustainability) to the lack of consensus on a single criterion (or a fixed weighted set of such criteria) for their description (see for example Verhoog, 2003, on the diversity in public perceptions of food naturalness).

The validity of the generated information crucially depends on product input and on the assumptions made for its process. The remaining of this section discusses the selection of characteristics for the application of the model and its sources of input (i.e., selection of decision-makers). The

[9] For an introduction to multiple criteria modeling see Dodgson et al. (2000), while for an application of the particular method in forestry see Diaz-Balteiro and Romero (2004).

[10] Friedman (1962), Zeleny, (1982, chap.1), and Romero and Rehman, (2003) distinguish "economic" from "technical" problems in that the former require decision makers to take into account multiple criteria. In that sense, it might also be stated that the ECHO framework approaches ethical optimization as an "economic" problem.

incommensurability of ethical values and the interpretation of the model's output are also discussed. Finally, differences to other approaches are highlighted.

2.2. *Selection of Characteristics*

The framework only refers to qualified food characteristics. It is proposed that these characteristics must satisfy three conditions (*CPR* characteristics): to be imperceptible (''*credence''* condition), to be relevant to citizen/consumer concerns (''*pragmatic*'' condition), and to be ethical (''*reasonableness*'' condition).

The credence condition restricts the application of the model to imperceptible characteristics. Perceptible characteristics are irrelevant to the framework because citizen/consumers may already consider them in their food purchase based on food appearance or prior consumption experience.

The pragmatic condition selects characteristics about which *the public* engages in debate. Thus, it protects recourses from being exhausted on assessing characteristics that live only in academic discussions.

The reasonableness condition reduces the number of eligible characteristics to those that correspond to ''ethical'' citizen/consumer concerns. For the purpose of this framework, citizen/consumers' concerns are regarded to be ''ethical'' when they satisfy two criteria. It must be possible to describe the sources of motivation that underlie these preferences as parts of what Rawls calls ''comprehensive doctrines of the good life'' (1996, pp. 58–59).[11] Also, these corresponding perceptions of the good life must be *reasonable* (Rawls, 1996, p. 193). In this sense, throughout this paper the term ''ethical'' is used in a fashion that is devoid of ontological connotations. To address herein (e.g.) environmental, health, naturalness, or humanitarian preferences as ''ethical,'' does not contain a claim on the metaphysical or on the rational validity of the particular egalitarian, self-interest, or religious values behind these preferences. In other words, to say that ''food naturalness'' is an ethical issue *does not* imply that ''food naturalness'' is *in itself* something that possesses (or possesses not) objective value, or that it is *by itself* something that somehow ought (or ought not) to be pursued, or that it is (or that is not) something *in itself*, at all, indeed. Instead, it implies a descriptive acknowledgment that there exist members of the society that consider these issues to be important to their own lives, and a normative acknowledgement that in a politically liberal democratic environment this is permissible. Given this account of the term ''ethical'' in the present paper, the ethical

[11] Similarly, Habermas (1993) referred to ethical issues as ''constitutive to personal perceptions of goodness (life plans) of individual members of the society, [that are] therefore […] necessary for their existential self-understanding.''

"characterization" of foods refers to the ranking of foods in terms of imperceptible characteristics for which citizen/consumers maintain ethical preferences. The reasonableness condition rejects characteristics like, for example, "made by white people," and thus it does not enable the consideration of related concerns in the market.

2.3. *Functional Input*

An overview of the information flow to and from the model is given in Figure 1. The selection of legitimate agents to make decisions about the criteria used for the description of characteristics, the importance weights attached to them, and the scales used for their measurement, is central for the validity of the generated information. For the market assumed by the framework, the role of information is to enable citizen/consumers to consider preferences for CPR characteristics in their market choices. To live up to this expectation, information must be relevant to the concerns of the consumers (Frewer et al., 1999). In other words, the weights, the criteria, and the scales used for scoring the performance of food options must refer to concerns stemming from citizen/consumers' own values, principles, and beliefs. We refer to this as the "*structural input validity*" condition.[12] This condition ideally requires that each individual citizen/consumer receives information that directly refers to her own perceptions. As such, the structural input validity condition points to concerned citizen/consumers as the legitimate source of input about "what (and how much) matters" in food production. This ideal situation seems difficult to achieve for at least two reasons. First, different people are likely to have different concerns stemming from different values, principles, and beliefs. A commitment to provide each and every citizen/consumer with personalized information might be technologically too complex to be feasible. Second, using citizens/consumers as the direct source of structural input seems to demand too much from individuals in terms of self-awareness and/or in terms of expertise (remember the regrettable "I don't want genes in my food" motto against genetic modification). The approximation to the structural input validity condition that can be proposed is that the description of characteristics

[12] The violation of this condition would run against the politically liberal assumption made in this study. The politically liberal assumption does not allow for further criticism of an existing view of the good life, once that view has been accepted to be reasonable (Rawls, 1996, pp. xxi–xxii; also Streiffer and Hedemann, 2005). For example, the structural input validity condition would reject as irrelevant to the decision-making process a view from an agrifood stakeholder that "genetically engineered food is natural" when this view disagrees with citizen/consumers' perceptions about what counts as "natural," even if reasonably based on the occurrence of inter-species gene transfer by bacteria and viruses in the wild. Within the ECHO framework a food supply actor must effect a change in citizen/consumers' perceptions to affect definitions of characteristics (Figure 1).

happens through deliberative processes[13] with the participation of focus groups of relevantly (e.g., environmentally) concerned citizens/consumers (peers). In these processes, stakeholders from the production sector, from the civil society, and social scientists should be invited to analyze and discuss the complexities of the issues at stake, and increase the chances for consensus. In the end of the day however, the produced descriptions must conform to the (deliberated) perceptions of citizen/consumers.[14]

To base descriptions of characteristics on citizen/consumers' perceptions does not exclude a role for science in the framework. Clear roles for scientists can be identified in informing deliberations and in the assessment of foods' performance for the selected criteria. Besides, science-based thresholds could be used as benchmarks for the further characterization of foods as surpassing (positive) or falling short of (negative) the minimal sufficient levels of the respective characteristic (e.g., ecological sustainability).

Finally, to ground the selection of characteristics and their description solely on citizen/consumer perceptions (and to avoid candidate absolutist descriptions of these characteristics) has the consequence that structural input is sensitive to shifts in citizen/consumer opinion. Possible reasons for such shifts can be technological change (which can challenge established norms by revealing new opportunities, Keulartz et al., 2004), the unexpected occurrence of disasters (which can lead to sudden changes in ethical priorities), as well as the development of conviction among the public that certain threats are becoming imminent (e.g., climate change). The ECHO framework can accommodate for such shifts in citizen/consumers' opinion by updating the model's structural input on a periodical or on an *ad hoc* basis.

[13] These processes may, for example, take the form of appropriately adopted consensus conferences (see Nielsen et al., 2006). For a presentation of other possible candidate methods for this step of the framework see, for example, Beekman and Brom (2007). An alternative possibility would be to derive structural input from the opinion of actors that either "interpret" or "represent" concerned consumers/citizens (e.g., social scientists, consumer associations, NGO's). It should be noticed, however, that moving away from concerned consumers/citizens as decision-makers risks introducing bias and compromising the validity of structural input.

[14] These processes could adopt a "common ground" approach to list these criteria only that are common across different concerned groups (sort of an overlapping consensus among concerned groups). Alternatively, it is also possible that these processes produce a full account of all criteria put forward by any concerned group. This alternative approach will reflect the pluralism in opinions among relevantly concerned citizen/consumers. Relative importance weights may refer to the number of participants that support each criterion. It would be perhaps desirable that weights also reflect the importance that different sub-groups of participants attribute to each criterion. The use of equal weights could also be considered. Criteria could be aggregated for the description of characteristics in a "maximized" or in a "most balanced" way (see Section 2.4). Criteria may take the form of (e.g., environmental or health) risk factors for which concerned citizens/consumers wish foods to be assessed. Interval or ratio scales, and local or universal scales may be used for their measurement, depending on the nature of the criterion and the characteristic at stake, and on product input data availability (see Dodgson et al., 2000).

Such updates give to the ECHO framework a dynamic nature. Too frequent reassessments, however, should be avoided as they would compromise the operational value of the model as a heuristic tool to guide production.[15] Also, because consumers' perceptions differ between different cultures (Frewer et al., 2004), the description of characteristics on the basis of citizen/consumers' perceptions makes the framework context and culture-dependent. Overall, structural input expresses culture-and-times-dependent perceptions of concerned citizen/consumers.

2.4. *"Incommensurability" of Ethical Values and "Additivity" of Criteria*

The aggregation of performances for different criteria of each characteristic usually assumes that criteria are "additive." In "compensatory" models, lower performances of a food option for a particular criterion can be compensated by higher performances for another. Mathematically, the additivity assumption holds when the criteria are "independent." Independence roughly means that the performance of a food for one criterion is not affected by its performance on another. This condition is not always easy to prove (for example, see Dodgson et al., 2000 Ballestero and Romero, 1998). Besides, additivity of criteria also raises philosophical questions that relate to the incommensurability of ethical values; roughly that caring a bit more for one's family cannot compensate for caring a bit less for the neighbor. Views on incommensurability differ.[16] This issue might prove to be critical when criteria (or characteristics) represent different ethical values, and especially when these values are parts of different views of the good life that happen to overlap in raising concerns about the same food characteristic. Diaz-Balteiro and Romero (2004) introduced a multi-attribute variation that offers a way for tackling this issue. The proposed method ranks options for a range of different additivity levels[17] to produce a range of "maximized" to "most balanced" results. This variation allows one to take the decision about the appropriate additivity level in a subsequent phase, presumably in agreement with the opinion of the legitimate decision-makers.

[15] Presumably, a periodic confirmation of characteristics, criteria, and weights every, say, 5–10 years could sound reasonable as on the one hand it would allow food supply actors to plan the ethical optimization of their production and services, while on the other hand it would allow the model not to lag too far behind the evolution of citizen/consumer perceptions. However, there may also appear reasons for *ad hoc* reassessments following food scares and crises.

[16] See Chang's (1997) analysis of incommensurability and Hardin's (1968) argument that scarcity of resources makes tradeoffs among ethical values inescapable in life.

[17] Levels range between zero ("no additivity") and one ("perfect additivity"). The in between values correspond to "different levels of additivity." Perfect additivity produces maximized "utilitarian" results. No additivity produces "most balanced" results, and it is interpreted as an "egalitarian" Rawlsian (MINMAX) solution with equilibrated achievements of different criteria (Zeleny, 1973; Romero, 1991 chap. 7; Diaz-Balteiro and Romero, 1998, 2004).

When compromises among different views seem untenable, then non-additivity can be assumed to produce most balanced results.

Essentially, the ''most balanced'' (''Rawlsian''; MINMAX) option assures that rankings will not reward the good performance of foods for some criteria (or characteristics) to the cost of their poor performance for others. In this way, the ''most-balanced'' option ensures that all identified criteria are paid attention to, and fits best with the politically liberal assumption of the framework. Nevertheless, this point is more relevant when criteria refer to different (that is, incommensurable) citizen/consumer values (concerns) rather than when they refer to different factors that co-contribute to the performance of foods for the same value. For example, while within a broad ''environmental sustainability'' characteristic one may identify criteria that refer to different values (e.g., the depletion of non-readily renewable resources, global warming, the preservation of biodiversity, etc.), it can also be the case that more than one criteria are relevant to certain values (e.g., impact on biodiversity may be affected by pesticide emissions and by the sort of fertilizer used). When the latter is true, then there may be cases where the politically liberal argument for balanced satisfaction of criteria loses its force. When different criteria refer to different citizen/consumer values, the Rawlsian demand for equity may guide the penalization of low performances for some criteria. However, when criteria are better seen as alternative ways for addressing the same value, reasons for penalization eclipse and the issue becomes merely to reward alternatives that work best.

2.5. *Interpretation of Output and its Communicated Form*

Because the selection (Section 2.2.) and the description (Section 2.3.) of characteristics in the ECHO framework does not require any assumptions about the metaphysical or the objective validity of structural input, it logically follows that the outputs of the model are also unfit for such interpretations. Therefore, by producing a food that ranks high in terms of (e.g.) ''naturalness,'' one cannot file any other moral claim except that the product fits well with the perceptions of relevantly concerned citizen/consumers about ''what it takes to be regarded natural.'' Whether these concerns and descriptions indeed enjoy in themselves a valid basis is an issue that is irrelevant to the politically liberal grounds of this framework, and it should better be deliberated upon during debates among relevantly concerned citizen/consumers. In this way it becomes clear that the function of the model is not to *assess* how much metaphysical or objective value rests with a food, but rather to *characterize* a food in terms of issues of concern to citizens/consumers, and on the basis of a set of criteria derived from citizens/

consumers' perceptions. The precise interpretation of the produced rankings also depends on the kind of preference scales used to score the considered food options for each criterion: i.e., on whether local or universal scales are employed.[18]

Similarly when a higher level of aggregation is attempted (a mathematically possible "overall" characterization), the numerical output of this process will not be valid as some teleological or perfectionist representation of the ethical value of a product. Instead, that numerical output would express a food's overall performance for CPR characteristics, on the basis of criteria that describe citizen/consumers concerns, according to weights that refer to citizen/consumer perceptions, and as compared to perceptibly equivalent (substitutable) food options. It should be noticed, however, that even a "most balanced" (see Section 2.4.) overall ranking of foods would only be meaningful to citizens/consumers that maintain concerns for the whole range of qualified CPR characteristics. However, because the "most balanced" option ranks foods for their satisfaction of the least accommodated characteristic, such an overall ranking could provide insight into the likelihood that a particular food option will be socially controversial.

Finally, it must be noticed that the form in which rankings will be communicated should not be confused with (and is not determined by) the, strictly speaking, output of the model. The model's output may be processed to take a form fit for effective communication, either as absolute numbers, or as percentages, geometrical shapes, color scales, etc. Besides, depending on the characteristic, it could be possible to combine rankings with other information to assess foods as "positive" or "negative" for the purpose of the respective characteristic. In that case, positive and negative rankings

[18] For the proposed multi-attribute methodology, the produced comparative rankings depend on the "best" (referred to as "*ideal*") and on the "worst" ("*anti-ideal*") product options considered. When "*local*" performance scales are used, then foods are compared to other *existing* marketed products. That is, the produced ranking will indicate that, for example, a tomato is, say, 50% natural as compared to the most and to the least natural tomato *available in the market* (what is the "most" and the "least" natural tomato is to be judged on the basis of the naturalness criteria suggested by citizens/consumers). Contrarily, when "*universal*" scales are used, then foods are compared to *technologically feasible* (though perhaps not yet realized) products. In that case, the ranking will indicate that a tomato is, say, 50% natural as compared to the most and to the least natural tomato that is technologically feasible. In the case of the naturalness example used here, technological change is perhaps more likely to affect the anti-ideal (i.e., the least natural) than the ideal (i.e., the most natural) tomato option referred to during the comparisons. For more detailed technical information on the use of such scales see Dodgson et al. (2000), while for the function of ideal and anti-ideal values for producing comparative rankings for the proposed methodology see Diaz-Balteiro and Romero (2004).

would not express comparative performances of possibly substitutable food options, but their performance as compared to scientifically or politically established benchmarks (e.g., one of ecological sustainability). The economic and normative consequences of such benchmarks can be far reaching, and their legitimacy will have to be carefully examined.

2.6. *Differences to Other Approaches*

The main distinguishing quality of the ECHO model is its dual political and economic perspective, able to produce information based on citizens' perceptions and on consumers' preferences. Other distinguishing qualities may include that the relation between criteria needs not be maximized (balanced rankings are possible, Section 2.4). Also, that ethical aspects of production are not translated into monetary values (products are directly characterized on the basis of citizens/consumers' perceptions). Besides, the relation between "ethical" and other preferences is not addressed by the model. Instead, the generated information may allow concerned citizen/consumers to make tradeoffs themselves in the market, by weighing the levels of ethical characteristics against other preferences and product price: citizen/consumers' tradeoffs may in a subsequent stage guide production. Finally, the model requires the description of characteristics in terms of technical criteria, and it produces gradient (non-binary) results.

The use of technical measurable criteria makes the model operational as a heuristic tool for product development. As compared with non-technical proxies, technical criteria can be expected to be more useful to food supply actors that want operational standards for the optimization of their production and services. Besides, because these criteria must be based on citizens/consumers' perceptions, they can have strong argumentative value for producers that need to support their choices in the public debate. Also, the reference to citizen/consumers' perceptions is likely to reduce discrepancies between citizen/consumers' understanding about what a label stands for and what the certification really guarantees, and therefore to serve better the purpose of facilitating informed consumption (for a relevant discussion of the organic label in the US see Sagoff, 2001).

Finally, the generation of graded output distinguishes ECHO from a number of popular ethical certification systems like the EKO, Biological, Organics, and FairTrade labels. Non-binary rankings enable a pragmatist understanding of food characteristics in terms of grades (or degrees, levels), rather than in terms of thresholds (Keulartz et al., 2004). They can replace vocabularies in which foods are either "fair" or "unfair" with more productive ones, in which foods are "more-" or "less fair" than other foods,

subject to citizens/consumers' account of "fairness."[19] Moving from binary certifications to comparative rankings can allow producers to improve the ethical characterization of their products by means of relatively modest (and therefore less costly) changes in the ethical aspects of their production, instead of being forced to achieve the higher standards of binary labels.[20] Different levels of characteristics at different prices can provide to citizen/consumers opportunities for tradeoffs between ethical and price considerations even when the price premium of the "full" label cannot be afforded. In doing so, non-binary rankings may have the important consequence to relax affordability constraints for ethical consumption.[21] Besides, comparative ranking does not only provide information on how well do products fit with citizen/consumers' preferences, but also about how unsatisfactorily they may do so. Therefore, the concerned citizen/consumer can get informed not only about

[19] It is perhaps true that citizens/consumers perceive ethical issues in terms of dichotomies (we thank an anonymous referee for indicating the need to clarify this point). For example, a food can be either "100% natural," or else "unnatural." To argue against such dualistic understandings would require demonstrating that they are logically incoherent. It is true that if or when an acceptable and logically coherent definition (e.g., one of naturalness or of equality) would be referred to, then, indeed, foods could be categorized as either "natural" or else "unnatural," and as either "fair" or else "unfair." Even in this case however, one will still be likely to encounter within the "unnatural" or the "unfair" categories foods that are more unnatural or more unfair than other foods. That is, not all unnatural or unfair foods are equally unnatural or unfair. Different unnatural or unfair foods can be in stronger or in weaker contrast with the demands of the considered naturalness or fairness criterion and presumably be preferred in the absence of perfectly natural or fair foods. We hope (because we find them more productive; Keulartz et al., 2004), and we expect (because of the existing plurality of perceptions about what it means for food to be e.g., "natural'; Verhoog, 2003), that gradient descriptions of characteristics will be produced by the deliberative citizens/consumers' workshops (Section 2.3). However, concerned citizens/consumers will have the possibility to insist on dichotomous characterizations of foods, either by identifying a single binary criterion that gets consensually acknowledged to capture all aspects of a characteristic, or by attaching a very high relative weight to some binary criterion that is perceived to capture its essence.

[20] Binary labels only reward major (and costly) changes required to achieve standardized certification levels. Consider for example a conventional apple producer that converts to biological production. The farmer must refrain from agrochemicals for two years so that residuals are removed, before his production gets certified as biological (EEC, 1991). This means that the farmer might face two years of lower productivity without the financial compensation that "full" biological labeling provides. In this way binary certifications may obstruct conversion from conventional to biological agriculture in self-regulating markets.

[21] The high price premium associated to binary values-based certifications can have a severe impact on ethical consumption. According to a poll commissioned by Milieudefensie, price considerations result in that only 2 % of all the meat sold in the Netherlands is organic, while three-quarters of the Dutch population holds that animal husbandry must be more animal friendly and environmentally friendly. To increase the chances for ethical meat consumption, and to consequently improve the quality of life for production animals, an ongoing public debate in The Netherlands deliberates on the introduction of a pragmatist middle third way in meat production: the so called "compromise animal" or "compromise meat," meant to "fill the yawning gap between the ideal of organic animal husbandry and the existing practice of the meat industry. [translation ours]" (Snoeijen, 2007).

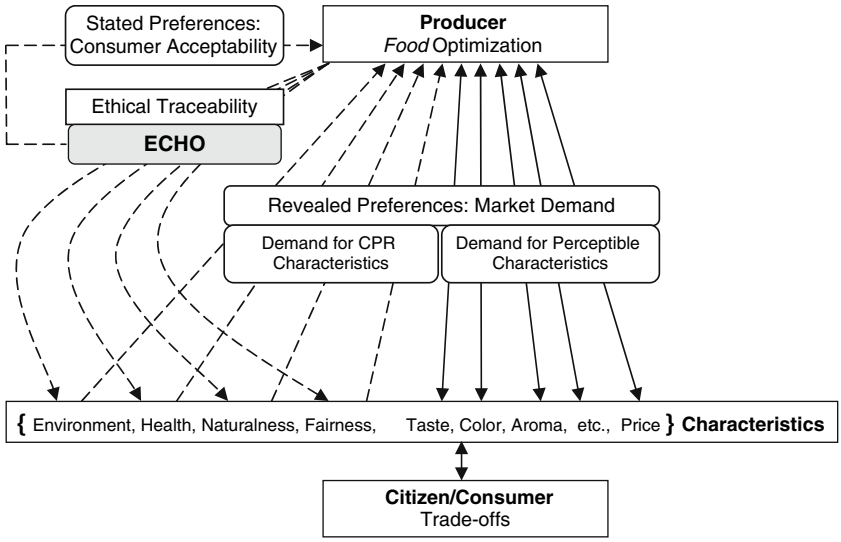

Fig. 3. Function of the ECHO framework: *Food* is considered as a bundle of characteristics. Arrows represent information flow. Bold arrows represent perceptible and price information. Dotted arrows represent information on CPR characteristics. The framework provides feedback to producers (a) on *Food* acceptability based on stated citizen/consumer preferences, (b) on market demand for *Food* characteristics based on revealed preferences. Market trade-offs of citizens/consumers are used to calculate "ethical elasticities" and to anticipate demand for *Food*.

which products to choose, but also about which products to avoid. In these ways graded characterization serves better the purposes of the market mechanism, because it eases the reallocation of resources and increases the opportunities for citizen/consumers to reveal ethical preferences. Too many grades, however, might appear confusing to citizens/consumers. Additionally, large numbers of grades will demand high precision for product input and, consequently, increased costs.[22] A sensible balance between clarity and effectiveness must be sought when implementing the model.

3. FUNCTION OF THE ECHO FRAMEWORK

The function of the ECHO framework depends on whether the generated information is made readily available to citizens/consumers (Figure 1 and Figure 3). When generated information is not made readily available to citizens/consumers, then characterizations can be used by food supply actors

[22] We thank an anonymous referee for alerting us on this issue.

as a structured indication of concerned citizens/consumers' stated preferences. When information becomes readily available so that concerned citizens/consumers can take it into account during their food consumption, then food supply actors can receive through the market mechanism feedback on the "actual" (i.e., the "revealed") CPR preferences of consumers. In the sections that follow a range of uses for the framework is discussed. The discussion includes applications that presuppose the availability of information to citizens/consumers. It must be stressed, however, that this discussion is not meant to provide a balanced argument for making information available to citizens/consumers. In such a discussion, countervailing arguments referring to, for example, information costs and producer rights should be addressed. Rather, this section aims to outline the uses of the framework in the case that information is indeed communicated, all other relevant issues elsewhere considered.

3.1. *Uses for Actors in the Supply Side of the Food Chain*

When information on the rankings of foods is not communicated to citizen/consumers (e.g., in the form of labels), then producers may use the model as an operational tool for the ethical optimization of their production. To perform this function, the model must be provided with structural input about citizen/consumers' perceptions, and then producers may apply the model on planned products so that they receive an early assessment of their ethical characteristics. This feedback can indicate the need to modify the qualities of planned products for the achievement of optimal levels for the preferred characteristics. The early assessment of citizen/consumer acceptability (and the subsequent optimization of production) can be valuable to producers who wish to minimize risks of suffering damages from investments in ethically controversial foods. In this way, the model may indicate the need for further research and/or for changes in research priorities, and can act as a heuristic tool to guide the optimal use of innovative technologies for the development of uncontroversial novel food products. Also, characterizations can be used by producers when they need to demonstrate a commitment in their production to the ethical convictions of citizen/consumers. In this function, the framework can help producers to defend their relationship with citizen/consumers and the long term profitability of their brand names. Additionally, the model could be used to illustrate the ethical aspects of their production for the attraction of ethical investors. Accordingly the model can facilitate long-term profit maximization for producers.

When the produced information is made available in the market, then additional uses for producers and citizen/consumers can be expected from

the application of the framework. For producers, additional uses can be twofold. First, the feedback from the framework gets upgraded from ''stated preferences'' to ''revealed preferences'' based on actual market choices of citizen/consumers. This means that it becomes possible to estimate actual correlations[23] between different levels of ethical characteristics and market demand, and accordingly to optimize the ethical aspects of planned products. Moreover, market feedback can allow producers to assess the ''ethical landscape'' of the market and to identify opportunities for new products and for ''ethical entrepreneurship'' (Korthals, 2004a). Second, information will allow socially responsible producers to illustrate in the market that their products are superior to perceptible substitutes in terms of CPR characteristics. The generated information may reveal that foods that are regarded to be substitutes for perceptible characteristics are not substitutes in terms of ethical characteristics (i.e., products that perform acceptably for CPR concerns of citizen/consumer, vs. products that do not). This ''ethical differentiation'' can help foods to disengage from price competition with ethically inferior products and claim added – ethical – price premium. In this way, information can allow producers who respect ethical constraints to gain advantage over those that do not comply with such constraints.[24] This might appear interesting to producers in Western countries that must comply with strict regulations (e.g., labor, environmental, or animal welfare).[25] It can be particularly interesting when trading in markets that are bound by international agreements not to block entry to products from

[23] That correlation could be expressed by an ''Ethical Elasticity of Demand.'' Ethical Elasticities of Demand would express the change in market demand following a change in the levels of CPR characteristics.

[24] Essentially, in the short term, the absence of relevant information ''punishes'' in the market those food supply actors that acknowledge ethical constraints to their profit maximization goals, while the availability of credible information provides for them compensation in the market. Though current market demand indicates that this compensation can be expected to be low, the recent ''GMO's'' controversy has shown that the availability of information may increase the consistency between stated and revealed preferences of citizens/consumers (Scholderer and Frewer, 2003).

[25] ''When applied to food and drink, the term ''quality'' [...] can certainly carry ''ethical'' connotations [...]. It's essential for us to know what qualities consumers are looking for in food, and which ones will persuade them to pay higher prices. This is because of the changing international environment in which the agrifood industry now operates. The barriers to international agricultural trade are falling fast, and there are many very powerful players out there who will fight tooth and claw for a larger share in world markets – especially bulk markets. […] I am confident that many farmers in the European Union will continue to compete effectively in bulk markets for the foreseeable future. But not all. Those that cannot win the battle on this ground must fight on different ground – and for many, that ground is high-quality production.'' Fischer-Boel, European Commissioner for Agriculture, 2006.

abroad that do not meet equivalent requirements.[26] Accordingly the framework can facilitate short-term profit maximization for producers.

3.2. *Uses for Citizens/Consumers*

In a straightforward way, citizens/consumers could use the generated characterizations to optimize food purchases for CPR characteristics (alongside the optimization for perceptible characteristics, subject to consumption constraints, and when relevantly concerned).

In economic terms, on the one hand citizens/consumers will be able to maximize the satisfaction of their preferences with the inclusion of CPR ones. On the other hand, by revealing CPR preferences citizens/consumers can present tangible incentives to producers for the optimization of the ethical aspects of their production. Normal market forces can be steered to develop the ethical dimension of food production by considering the satisfaction of CPR preferences for the optimal allocation of scarce resources. Accordingly the framework can facilitate the ethical optimization of food production.

Similarly in political terms, because the generated information refers to citizens/consumers concerns, on the one hand it can help citizen/consumers to consume foods that fit better with their own reasonable views of the good life. In this function the framework can help dissolve trust crises by enabling informed choices.[27] On the other hand, rankings can allow citizens/

[26] One can refer to competition between products that have been subjected to environmental constraints (e.g., in signatory countries of the Kyoto Protocol) and products that have not been subjected to environmental constraints. For as long as corresponding environmental policies lack support from "scientifically sound risk assessment" (Kerr, 2003), the World Trade Organization (WTO) may object to devising national market barriers against products that fail environmental requirements. In the absence of relevant and citizen/consumer-perception-based information, environmentally "unconstrained" – and therefore presumably cheaper – products may engage in price competition with "constrained" ones. Other examples may refer to animal welfare, labor income, and working conditions.

[27] Trust crises often relate to the way risks are defined and managed by "others" (Slovic, 1999; Salaun-Bidarta and Salaun, 2002; Korthals, 2004 b). Frewer (2003) argued that when communication activity does not address the ethical issues consumers are concerned about, then "this information may have appeared, at best, irrelevant to consumers, and at worst may have seemed to be an attempt by the information source to hide from the public what the public perceived to be the 'real' risks of the technology." Because rankings refer to the perceptions of concerned citizens/consumers, the ECHO framework minimizes decision-making "by others" about what is important to know. Accordingly, it addresses the trust relation between citizens/consumers and food supply actors by shifting the focus of citizen/consumers' trust from the practices of food supply actors to the adequacy of the monitoring and auditing system used for the collection of technical information for product input (i.e., to the ethical traceability system in operation). For the successful implementation of the framework it is crucial that citizen/consumers will regard any institutionalized ethical traceability system as credible and trustworthy. A role for the government could be identified in monitoring and in supervising the overall good application of the framework.

consumers to express in their food consumption reasonable values, principles, and beliefs that relate to their effect on others (i.e., people, animals, environment, future generations, nature, etc.). Accordingly, the ECHO framework can facilitate the politically liberal and democratic allocation of scarce resources when citizens' concerns are not (or should not be) addressed by state regulation.

3.3. *A Basic Conceptual Illustration*

A basic conceptual illustration of some of these functions is provided with the help of Figure 3. Let us consider the case of a food producer (breeder) that plans the development of the new competitive product *Food*. Let us also assume that the breeder sees opportunities for improved production in plant genomics research.[28] To realize her goals, the breeder must make choices about the desired characteristics of the new product (Should *Food* be tastier, or should it be cheaper?). Nurtured by the controversy about GMO's, the breeder decides to pay also attention to CPR aspects of her production (Will an "environmentally friendlier" but "unnatural" product raise controversy?). These choices will set the priorities in the research agenda for plant genomics (Should pest resistance or *Food* aroma be researched?) and will affect the method of application for its insights (Should genetic engineering or conventional breeding be used?). To optimize the levels of ethical characteristics the breeder may choose to use the ECHO model as a heuristic tool for guiding product development (If *Food* has, say, such and such characteristics, would it rank higher than existing products in citizen/consumers' perception?). When trust controversies arise, the breeder illustrates ethical production based on the comparative qualities of *Food* as assessed on the grounds of stated citizens/consumer preferences. However, the producer still needs to justify tradeoffs among levels for CPR characteristics, and also between levels of CPR characteristics and other producer choices (e.g., health risk tolerance levels against taste enhancement). Tradeoffs might not appear acceptable to citizen/consumers and trust controversies may still arise.

When CPR rankings are available in the market, then the focus of citizen/consumer trust shifts from the practices of producers to the credibility

[28] There are reasons to believe that plant genomics bears a significant societal and economic potential because it can enable technological solutions to food-related problems (Nap et al., 2002; NWO, 2001). However, technological solutions can be assessed differently in the context of different concerns. Besides, the overall assessment of foods depends on a large range of criteria that concern the end product as well as its production history. Therefore, technological solutions cannot straightforwardly guarantee citizen/consumer acceptance for the resulting foods, and the "ethical assessment" of planned products remains important (Michalopoulos, work in progress).

of the ethical traceability system in operation. When a citizen/consumer encounters *Food*, she will get informed on its performance for CPR characteristics, comparatively to perceptible substitutes and according to the deliberated perceptions of her peers (the relevantly concerned citizens/consumers). Information indicates how does *Food* perform for some characteristic (e.g., for naturalness) as compared to existing or to technologically feasible alternatives (other tomato options). The consumer chooses (or does not choose) *Food* over a possible substitute. Concerns are voiced and the satisfaction of CPR preferences gets optimized subject to consumption constraints (Should I buy a more "environmentally friendly" but less "natural" food? Is this price difference a sufficient reason to buy a product that ranks so low for "fairness of production"? Does this price difference refer to a characteristic that I am concerned with? Do I want to support this kind of food production?). The market choices of citizens/consumers reveal their preferences and allow the correlation of market demand with levels of CPR characteristics (How much does it actually pay to rank higher for environmental friendliness?). The producer can disengage from price competition with products that perform unacceptably for CPR characteristics, and claim a price premium for the ethical superiority of her production. Producers see tangible incentives for the ethical optimization of food production. The market becomes consumer-driven for ethical issues. The relation between CPR and perceptible characteristics of planned products can be optimized so as to better attune foods to the preferences of targeted markets. CPR optimization affects the practices of a range of actors in the production side of the food supply chain (Should biological pest management be applied? Should "closed" production systems be employed? Should air transportation be used? Should colorings be added? What packaging material should be chosen?). Research priorities for plant genomics get redefined. Resources get reallocated so as to regard ethical preferences of consumers. The ethical dimension of the market gets developed.

CONCLUSIONS

This paper has outlined a framework for the ethical characterization and subsequent optimization of foods (ECHO) in terms of characteristics about which consumers/citizens maintain concerns. The framework produces information on "credence," "pragmatic," and "reasonable" food characteristics, with the purpose to facilitate the well-functioning of the market. The paper assumes a political viewpoint in that the well-functioning of the market is taken to require that the market performs the operations anticipated by the particular political context within which the market operates.

A model politically liberal democracy and a neoclassical market were assumed for this purpose. Valid information was taken to allow concerned citizens in markets to make choices on goods that they perceive to be important to their own lives and to their relation with others (i.e., people, animals, environment, future generations, nature, etc.). The framework makes use of multi-attribute modeling. The proposed model produces ''maximized'' (utilitarian) to ''most balanced'' (MINMAX) non-binary aggregate rankings of food products. The model requires the description of characteristics by means of criteria and weights (structural input) and technical input on the performance of foods for these criteria (product input). Structural input is based on citizens/consumers' perceptions. Availability of product input has been assumed. Potential uses of the generated information have been identified for citizens/consumers, for producers, for their trust relation, for the use of innovative technologies, and for the optimization of the ethical aspects of production in self-regulated markets. So long as, and to the extent that, certain citizens' concerns are not addressed by state regulation, the ECHO framework has the potential to bring rewards for food supply actors that take citizen/consumer concerns into account, and to facilitate the politically liberal and democratic operation of the market.

This paper treats a controversial issue, loaded with ethical, epistemic, and practical difficulties. We have presented an effort to navigate among these difficulties in a politically and economically consistent way. The present paper does not suggest that the market is (or that it is not) the appropriate arena for the regulation of any particular good of concern to citizens. Rather, this work is concerned with the generation of information that is required if citizens' concerns are to be expressed in the market when state regulation is, as a matter of fact or of norm, constrained.

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