

Market failures in supplying animal welfare: some conceptual thoughts for future research

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Abstract

Providing adequate levels of farm animal welfare is a challenge in today's societies. Economic research shows that neither market valuation for credence attributes in opaque markets, nor transparency improved market valuation with labelling schemes, nor non-market valuation in hypothetical markets to take account of non-use values, nor non-monetary valuation in an ethical context will suffice to provide adequate levels of farm animal welfare. Monetary and non-monetary valuation problems stem from the complex concept of farm animal welfare and ethical challenges in utilitarian and anthropocentric approaches. Animal centred valuation of farm animal welfare is suggested as one future venue of economic research requiring to leave behind speciesism.

Keywords: farm animal welfare; public good; transaction costs; hypothetical bias; animal centred valuation;

Introduction

Provision of farm animal welfare (FAW) suffers from different forms of market and other institutional failures and is thus provided at suboptimal levels from a societal welfare perspective (e.g. Grethe 2017; Harvey et al. 2013). In the absence of reliable information about FAW, as a credence attribute, in existing markets for animal products mechanisms of adverse selection (cf. Akerlof 1978) lead to suboptimal FAW provision. Within market-based approaches assuming the availability of better information, labelling programs are discussed and have been implemented widely to solve the adverse selection problem. Still these programs' successes remain limited indicated by generally low market shares. Also, traditional government interventions are hardly able to provide a level of FAW that seems optimal within societies as high FAW standards might cause welfare losses for consumers who are not interested in FAW (e.g. Bennett 1997). At the same time institutional innovations are developed by market actors: In Germany an alliance of retailers and farmer organizations innovated an institutional setting (Schulze-Geisthövel 2018). Within this system farmers are financially compensated from a retailer fed fund when implementing higher FAW standards. Until 2018, the system worked without product segregation and without labelling products at the point-of-sale – thus introducing a quasi *private tax-and-subsidy-system* in the market. From these diverse perspectives, it is worthwhile to look at different institutional settings from an economic perspective in order to gain a better understanding of possible shortcomings of hitherto existing approaches and derive possible research needs.

Asymmetric information and FAW as public good

Labelling of FAW has been suggested as an instrument to increase FAW at farm level by improving market transparency and allowing better-informed purchase decisions for consumers. However, individual consumers buying FAW labelled products contribute to the provision of FAW as public good. Public goods' general characteristics are non-rivalry and non-excludability, i.e. as FAW is provided in a society no one can be excluded from enjoying this increased FAW and enjoying this increased FAW does not reduce consumption possibilities

for others (Cowen 2006). Thus, if FAW is understood as a public good, its provision would be expected to suffer from free rider effects. Circumventing the free rider problem is attempted by market differentiation and creating *club goods* within private approaches. Implemented as private or public labelling, these approaches implicitly assume that for the public good FAW excludability can be created. However, Uehleke et al. (2018) show that stated demand for FAW in an individual situation is lower than in a collective situation indicating the difficulty to create excludability. These results challenge public and private labelling approaches for FAW and suggest to treat FAW as a public good. When Enneking (2019) finds low WTP for FAW in a real market experiment the public good character of FAW is neglected. The private vs. collective decision framework of Uehleke et al. (2018) could partly explain these low revealed WTP for FAW in a market experiment.

Transaction costs and network externalities in a market context

Low provision of FAW can also be understood as a network externality linked to supply- and demand-side economies of scale. Some authors also term this as the 'infant industry' argument (e.g. Hartmann et al. 2015). Within nascent and marginal FAW labelling programs transaction costs are high and economies of scale can not be realized yet.

Shelf prices of FAW products indicate pagatoric costs in terms of financial means required to purchase a product. Yet, additional calculatory costs might be linked to the purchase process of FAW products. For consumers, shelf prices of FAW products neglect high *transaction costs*, like information, search and transportation costs, as long as FAW products are not readily available in standard retail formats. In most cases, transportation costs would be pagatoric costs, as might be the case with some information costs if information has to be paid for. Larger shares of transaction costs might be rather calculatory costs for time spend by consumers for searching and transporting FAW products available in few and possibly distant retail formats. Valued at time's opportunity cost, no monetary flows of financial means are linked to these transaction costs while still being real, as time spend for searching and transporting might be considered utility-reducing. Through online-shopping, search costs might be reduced and transportation costs would be transformed into pagatoric logistic costs.

Additional transaction costs stem from dispersed demand for FAW products. Pooling of FAW demand by consumers could accelerate development of supply of FAW products. Yet this pooling of demand requires collective action. Establishment of collective action is also linked with transaction costs. No single potential consumer of FAW products has incentives strong enough for pooling demand with other potential consumers. However, once this pooling would have been organized, all FAW-interested consumers would benefit. This illustrates a typical prisoner dilemma due to network externalities in demand. As soon as market shares of FAW increase and products become readily available in standard retail format, transaction costs for consumers will decrease. Thus, high transactions costs linked to dispersed demand and small supply quantities indicate economies of scale in demand and network externalities in pooling of demand.

On the supply side, actual demand linked to higher prices for farmers and supply-chain-actors would incentivise the provision of more FAW. Due to underdeveloped markets and a lack of observable market prices, stakeholders are dependent on WTP estimates. Single private actors with no market power often lack incentives to invest in market developments, as WTP studies are said to suffer from hypothetical bias (see discussion below) and as calculatory consumer prices in nascent programs are prohibitive for growth (see discussion above). In addition, investments in the reputation and trustworthiness of a label program are only feasible if large product quantities can be included in the label program. Otherwise the per unit cost of building-up a label becomes prohibitive. Also processing, logistics and trade of FAW labelled products require large quantities to be produced and sold in order to realize economies of scale.

It can be concluded that multi-actor private initiatives are caught in lock-ins of a prisoner dilemma as no single market actor has incentives to invest in establishing label programs. If transactions cost for forming multi-actor-initiatives decrease or if market actors with considerable market shares and market power take the initiative and if opportunity costs of neglecting labelling programs increase, market actors – especially those with market power or a number of smaller actors supported by government initiatives – will have more incentives to ally themselves for the establishment of labelling programs (cf. Grethe 2017).

Informational dilemmata

Standard economic reasoning suggests government interventions including minimum standards, bans, subsidies and taxes (cf. Grethe 2017; Ingenbleek et al. 2012). Recent behavioural economic research and

political economy considerations challenge such classical approaches (Carlsson et al. 2007; Harvey et al. 2013). This also applies to publicly funded and promoted classical information and education approaches that might not lead to better-informed consumer decisions due to information overload and possible information misconceptions of the complex FAW concept (cf. Buerke 2016; Fitzpatrick et al. 2016; Hoogland et al. 2007; Hotaling et al. 2015; Köcher et al. 2016). More information does not necessarily mean better information and more labels on food products might decrease willingness-to-pay (WTP) (e.g. Monier-Dilhan 2018). New governance structures for wider stakeholder participation, like deliberative polls or citizen assemblies, are discussed to allow better-informed decision-making (cf. Grethe 2017; Rovers et al. 2017; Schulze-Walgern et al. 2018).

Monetary valuation of FAW at societal level

The provision of FAW is necessarily coupled with producing physical animal products indicating a conceptualization as positive external effect in production (Carlsson et al. 2007). On the consumption side, consumers' perceptions that certain aspects of livestock production give rise to low FAW are a potential source of disutility. This disutility may be associated with consumers' individual consumption of livestock products and with other persons' consumption. The latter is a negative externality of consumption in society (Harvey et al. 2013), resulting in indirect costs associated with livestock production. In a societal transformation curve, the optimal level of providing animal products and FAW would be determined by the negative inverse relationship of the respective prices. While market prices of animal products are readily available, there is no market providing monetary price information on FAW. Price estimates for FAW would be required to determine a society's optimal production point. Yet, economic analyses of FAW suffer from a dearth of price information on FAW. Yet, several approaches have been employed or could be employed to derive prices for FAW independent of physical production (Yang et al. 2019).

WTP studies have been a common approach to give FAW a 'price'. A high number of WTP studies for FAW are available based on stated preferences. Yet most of them are said to suffer from different forms of hypothetical biases defined as the difference between stated and revealed WTP (Hensher 2010; Lagerkvist et al. 2010; Clark et al. 2017). In some other contexts, differences between stated and revealed preferences are also termed as citizen-consumer duality or consumer-citizen-gap (e.g. Grethe 2017; Hartmann et al. 2015). These terms emphasize the difference between a private good character of animal products with certain FAW attributes for which *consumers* would show WTP in a market context and a public good character of FAW for which *citizens* would show WTP in a non-market context through supporting minimum standards and accepting the resulting higher market prices or through supporting a tax-and-subsidy system. From a more psychological perspective, the difference between stated and revealed WTP is referred to as attitude-behaviour-gap (e.g. Harvey et al. 2013; Hartmann et al. 2015). Several hypotheses have been brought forward to explain hypothetical bias in general and more specifically to FAW (cf. Hartmann et al. 2015):

Hypothetical bias in revealed vs. stated WTP studies might be linked to low vs. high involvement purchase decision situations linked to the basic concept of dual process model of thought. According to this model, one process is fast, intuitive and reliant on short cuts and heuristics (system 1), and one is controlled, analytic, slow, deliberate, and easily fatigued (system 2) (cf. Kahneman 2002 & 2011). In this context, WTP studies working with survey methods activate system 2 of analytic, deliberate and slow thinking where complex dimensions of FAW might rather lead to high WTP estimates compared to low involvement situations in daily shopping. In low involvement situations, participants in observational studies might rather remain in system 1 of fast thinking neglecting the complexities of FAW. Thus, remaining in system 1 might lead to purchase decisions revealing low WTP for FAW. In this context, Hartmann et al. (2015) refer to the 'meat antagonism' as one reason for hypothetical bias in WTP studies for FAW. While consumers feel empathetic about farm animals they are faced with the dilemma that animals have to be raised in confined systems and slaughtered for being able to enjoy meat, milk, eggs or any other animal product. Stated WTP for FAW could then be interpreted as the WTP for solving this dilemma in a high involvement survey situation where system 2 is active. Low involvement, routine purchase situations with low revealed WTP for FAW would indicate the psychological capability of humans within system 1 to suppress the meat antagonism dilemma. In such situations consumers use heuristics to delegate responsibility of solving the meat antagonism to supply chain actors to allow them quick and easy purchase decisions leading to low levels of revealed WTP for FAW.

In addition, strategic response behaviour to incentivise a broader and more diverse future supply of FAW products and to create future consumption options might lead to over-stating WTP (Bergeron et al. 2019; Lusk et al. 2007). This might be linked to high transaction costs in the formation of collective action as described

above. Strategic response behaviour in overstating WTP for FAW might be considered as a short-cut of leaving the prisoner dilemma faced in dispersed demand for FAW.

Due to a dominance of WTP studies based on stated preferences, more observational studies based on revealed preferences for FAW would be required (e.g. Enneking 2019; Olesen et al. 2010). Hedonic price analyses would be a possible solution. This approach assumes that the price of a good can be decomposed into prices of the attributes that make up that good (Lancaster 1966) therefore being able to de-couple physical product attributes and FAW. Few WTP studies based on this approach are available (e.g. Chang et al. 2010; Karipidis et al. 2005). Already Bennett (1995) concisely discusses the limitations associated with hedonic price analyses in the context of FAW:

“First, there is only a very limited number of livestock products on the market which have clear animal welfare friendly attributes in the eyes of consumers. Second, estimates of consumers’ valuations of these attributes from purchasing behaviour still fail to capture public good and non-user aspects. Third, any analysis of existing animal welfare friendly production practices is necessarily ex-post and may be of little help with ex-ante analysis of possible legislation or codes of practice, except by analogy. Arguably, ex-ante analysis is of more use to policy makers.”

Non-monetary price trade-offs that could be transformed into monetary values would be an additional alternative to estimate WTP for FAW, e.g. time invested for caring for animals to improve FAW or time for lobbying FAW valued by the opportunity costs of time of the referred persons. The literature is characterized by a paucity of studies taking such approaches with respect to FAW but provides examples in other fields (Adamowicz et al. 1991; Matumoto 2014).

FAW credits – analogous to CO₂-credits – have been proposed as a market based approach in economics in an attempt to decouple markets for animal products and FAW and deriving values for FAW (Lusk & Norwood 2011). Within such an innovative scheme, farmers (or any other animal care-giver) would be given property rights on the provision of FAW independent of physical production of animal products. Such FAW credits could be traded independently from physical product flows. They could be bought by FAW concerned consumers directly irrespective of their dietary preferences for animal products or by any consumer representatives such as retailers in order to create larger demand and thus supply for FAW. The above described German ‘Initiative for animal welfare’ (Initiative Tierwohl) has had some of these components in its non-segregation design until 2018. In addition, donations to animal protection organizations working to improve FAW could be interpreted as a first proxy of such FAW credits (De Backer 2015; Haynes et al. 2004). So far, there is a lack of empirical research putting these monetary flows into relation with specific efforts to improve FAW, which would allow deriving monetary values for more specific FAW measures.

FAW as a complex good

A comprehensive concept of FAW might be ambiguous and too complex for utility based WTP studies (cf. Serpell 2004; Mathews et al. 2007) whereby use and non-use values are typically considered. This might be similar to what has been discussed within ecological economics in the valuation of biodiversity (e.g. Bartkowski et al. 2015). Additionally, it is argued that aesthetic considerations lead to difficulties in monetary valuation (e.g. Martín-López et al. 2007 & 2008). Furthermore, a high complexity in defining what is meant by biodiversity might have similarities to defining FAW (e.g. Farnsworth et al. 2015). Some authors argue for valuing biodiversity like other abstract goods for instance ‘justice’ (Meinard et al. 2011), which give further indication of the challenges linked to the monetary valuation of FAW.

Similar to biodiversity, FAW is embedded in philosophical, religious and ethical contexts posing particular challenges to the monetary valuation of FAW (Potthast 2014; Spash 2009). Valuation studies in environmental economics indicate ‘commodification’ as violating people’s moral standards leading to a crowding-out effect (Neuteleers et al. 2014). In general, crowding-out refers to the process of external incentives diminishing intrinsic motivation. Valuation studies of FAW might suffer from similar caveats (Bennett et al. 2002) leading to possible biased WTP estimates through protest answers to WTP-questions in a survey. Protest answers can lead to outliers in monetary WTP studies, which remain hidden in the calculation of mean values and lead to biased WTP for FAW (cf. Frey et al. 2018). Thus, moral goods would in principle elude monetary valuation because they are not accessible to exchange considerations within trade relations in a market nor in a non-market setting (‘money for goods/products/services’). There is growing evidence of a strong foundation of FAW in complex animal ethic systems (Luy 2018) indicating a need for comprehensive and non-financial, social psychological and ethical valuation approaches (cf. Spash et al. 2009).

WTP studies on FAW based on stated preferences might further suffer from social desirability particularly when surveys are implemented in face-to-face interviews (Yang et al. 2019). An additional bias to be distinguished from social desirability in answering survey questions is termed as “purchase of moral satisfaction” (Bennett et al. 2002). Higher stated than real WTP for FAW stems from a “warm glow” that respondents get for demonstrating WTP to help a good cause, in this case for FAW. Demonstrating WTP for FAW might then also be linked to a positive self-image of respondents being higher within experiments than outside, i.e. stated WTP is higher than revealed WTP (Johansson-Stenman et al. 2012). These biases highlight the complex relationship between moral behaviour and the limits of monetary valuation.

Additionally, also benefits and efforts for farmers providing FAW go beyond financial cost-benefit-analyses (Wildraut et al. 2018). Non-use values represent any other economic value farmers derive from FAW. These types of values may explain why farmers take actions to provide FAW beyond the requirements imposed by legislation, productivity and profitability considerations (e.g. Schreiner et al. 2017). Legal or financial incentivization thereby risks a crowding-out effect undermining farmers’ intrinsic motivation for provision of FAW. Lagerkvist et al. (2011) further developed the notion of non-use values in FAW by defining it as consisting of five theoretically distinct types: Pure non-use values, existence values, bequest values, option values and paternalistic altruism (cf. Hansson et al. 2018). Specifically, warm glow effects or impure altruism based on emotion-driven farmer-animal-relations further emphasize these non-monetary benefits and costs. Impure altruism refers to the possibility of animals to ‘pay-back’ to farmers higher FAW standards not only in terms of higher productivity but also in closer human-animal-relationships, i.e. farm animals would reward farmers emotionally for higher FAW measures. This would lead farmers to provide more FAW than what is rewarded monetarily in a market or other institutional setting.

FAW between anthropocentrism speciesism

So far, our discussion has taken an *anthropocentric perspective* neglecting animals’ own perspectives and preferences (Johansson-Stenman 2006). FAW is an instrument to provide welfare to humans thus being a strictly utility oriented. In this utilitarianism view (cf. Cowen 2006) only information about human utility measured within real or hypothetical monetary or non-monetary markets or institutions is employed. FAW is accounted indirectly through human WTP for FAW in the absence of WTP studies for animals themselves. One shortcoming of this perspective is that it assumes humans to be able to assess FAW in their own view. Several studies highlight the difficulty to define FAW properly (e.g. Grethe 2017).

In naturalistic based animal behaviour studies animals are treated paternalistically with apodictic claims (e.g. D’Silva 2006). Implicitly they assume FAW to be a *meritorious good* whereby some people claim to have a better understanding of what seems to be the right level of FAW (Dawkins 1998). Thereby, animals are not allowed to be included in societies’ and markets’ trading and negotiation relations directly. Within such an approach, improving FAW is assumed to be detached from any resource competition. However, providing FAW requires resources directly or indirectly through less productive physical production and less efficient use of natural resources. Therefore, animals’ preferences under consideration of trade-offs and substitutional effects with other scarce resources should be known to include animals more directly in the market and trading relations about FAW.

If humans are not able to assess animals’ own perspective on FAW, the utilitarian view of FAW might be misleading. Allowing animals to participate directly in trade with scarce resources in society would allow these trade-offs to be balanced. However, there is a dearth of WTP studies based on monetary and even non-monetary prices considering *animals’ preferences* estimated by animal behaviour. With such approaches, FAW claims could be objectivized and transformed into resource requirements (Dawkins 1990). Different attempts have been made, for instance whereby “demand curves” for hogs have been estimated by putting food or social contact in exchange for physical efforts (Matthews et al. 1994; Pedersen et al. 2002). Physical efforts could then be transformed into monetary values by linking them also with access to feed. A similar study looked at demand of calves for social contact (Holm et al. 2002) and the demand of hens for litter vs. food was tested (Dawkins 1993). Only few specific aspects of FAW measures have been investigated for few farm animals with these approaches yet. Additionally, few attempts have been made yet to monetarize demand curves of farm animals for specific FAW measures. Lusk et al. (2011) already concluded:

“Although we are aware of economists conducting experiments with animals to test economic theories of consumer choice and of animal scientists conducting experiments with animals to determine relative preferences for different components of a production system, we are unaware of joint efforts to determine the economic value animals place on production systems similar to the kind

of human consumer preference work done for cost-benefit analysis. This is an area that is ripe for future research, especially for those interested in non-speciest cost-benefit analysis.”

It is not clear yet why these earlier suggestions have not been taken up in agricultural economics research.

Future research directions

Based on the above considerations, we highlight some research directions:

- In WTP-studies on FAW, not only mean values should be aimed for, but rather a better understanding is required why respondents give extreme values or reject the exercise altogether. This would give better empirical evidence of people’s rejection of monetary reasoning about FAW and supporting the notion of ethical questions involved. Determinants of ethical considerations should be analysed in more detail.
- Dual models of information processing taking advantage of Kahneman’s system 1 and system 2 concept might be a venue to better understand differences between stated and revealed WTP estimates for FAW. More empirical research would be required to test these linkages. This also calls for more observational studies and real-world experiments.
- Valuing FAW poses complex problems within traditional WTP studies similar to what has been observed in the valuation of biodiversity. New approaches and concepts in a rich literature on the valuation of biodiversity, like concepts of valuing complex goods, could be transferred to the valuation of FAW. Also possible crowding-out effects due to moral concerns about commodification of FAW have to be considered.
- Due to high complexities in valuing FAW within government interventions, new participation mechanisms in forming of the political will are required but have not been analysed in the area of FAW. Deliberative polls, citizen assemblies and similar approaches should be tested and evaluated from a scientific perspective, if they are able to provide better informed political decision-making on FAW.
- WTP-studies from animals’ own perspective on FAW are required. For this purpose, economists should collaborate with animal ethologists to integrate these two perspectives into the development of a FAW framework that considers animals’ own views. In this framework, animals would have to make choices to receive more FAW by renouncing other benefits (e.g. how much feed is an animal willing to renounce to gain more space). By attaching monetary values to the amount of benefits renounced it would be possible to link these values to human monetary trading systems. This would help to reduce anthropocentric and paternalistic approaches to the provision of FAW.

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