

Product differentiation under the WTO: an analysis of labelling and tariff or tax measures concerning farm animal welfare

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Abstract

This report examines the possibility of giving preferential treatment in the EU to imports of meat products that meet improved standards in terms of animal welfare in production. Three specific forms of preferential treatment are considered here as possible measures for increasing levels of animal welfare in meat production in the EU and its exporting partners: labelling of products (either voluntary or compulsory), differentiated import tariffs and differentiated consumer taxes. The likely admissibility of such measures under WTO rules is assessed by means of an analysis of previous decisions by WTO dispute settlement panels. It is concluded that all of the measures analysed have a possibility of being upheld, based on a defence relying on Article XX of the GATT and perhaps also the TBT Agreement. While the incentives offered by labelling could be reinforced with differentiated tariffs or taxes, these financial instruments involve various additional complications. They could best be considered after the possibilities of regulated labelling schemes have been exhausted.

1 Introduction

This paper examines the possibility of giving preferential treatment in the EU to imports of agricultural products that are 'sustainably-produced' relative to those that are deemed to be less sustainably produced. Sustainable production is defined as processes and production methods (PPMs) that meet specific standards with respect to criteria such as environmental impacts, animal health, and animal welfare. The issues are examined here in the context of animal welfare in meat products where preferential treatment would be given to meat products that meet improved standards in terms of animal welfare. The motivation for giving preferential treatment to imports, and potentially also domestic production, of such products is, at the broadest level, to improve the sustainability of production methods for agricultural products both in the EU and its trading partners.

The next section summarises the issue of PPMs and the WTO and presents three possible measures: labelling of animal welfare standards in meat production, differentiated tariffs for imported meat products according to the level of animal welfare in production, and differentiated internal taxes on meat products. The third section then summarises the results of a detailed legal analysis of the potential admissibility of the three measures with reference to case law in the WTO dispute settlement proceedings. The fourth section then analyses the potential effectiveness of the measures in meeting the stated goal. This analysis is quite preliminary and qualitative in nature; accordingly, the concluding section identifies some of the more important issues for further research, as well as offering tentative policy recommendations.

2 Background on animal welfare and policy responses

In WTO terminology, 'processes and production methods' (PPMs) are defined as the way in which products are manufactured or processed (WTO 2004b). Animal welfare is an example of a non-product related PPM issue, which refers to fact that meat products are generally not distinguishable according to the level of animal welfare in production. In other words, non-product related PPMs do not affect the physical characteristics of the final product (OECD 1997). Policy measures related to non-product related PPMs are generally considered to fall outside specific WTO agreements dealing with product standards, such as the Agreement on Sanitary and Phytosanitary Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT), and thus potentially conflict with WTO principles.

Animal welfare receives more legislative attention in the European Union (EU) than in many other regions of the world. Animal welfare standards for farm production, transport of farm animals and slaughter are generally taken to be higher in the EU than in meat-producing countries exporting to the EU, particularly developing countries (WTO 2000a). This paper addresses differential treatment of meat products on the basis of animal welfare. In addition to the regulatory process standards on animal protection, there is a growing array of private standards in the retail of animal products in the EU (OECD 2004). But, as competition takes place largely on the basis of price, animal welfare in the production of most of the animal products produced and sold in EU supermarkets is at the minimum, regulatory level.

From a policy perspective, the preferred situation is one in which countries can agree on common standards and institutionalise these in the form of international agreements, such as under the auspices of the World Organization for Animal Health (OIE 2004). But such a process of negotiating an international treaty can take a very long time, and the question is whether other options are available in the interim. Countries are free to set such standards for their own production but these have a more limited effect when products are traded internationally and when higher standards imply increased production costs. In the case of the EU - where imports account for 7-8% of the supply of beef and poultry - then improving domestic PPM standards may simply result in increased imports of less sustainable products.

In this paper, three specific forms of preferential treatment are considered as possible measures for product differentiation that aim to improve animal welfare standards in the EU and its exporting partners: labelling of products (either voluntary or compulsory), differentiated import tariffs and differentiated consumer taxes.

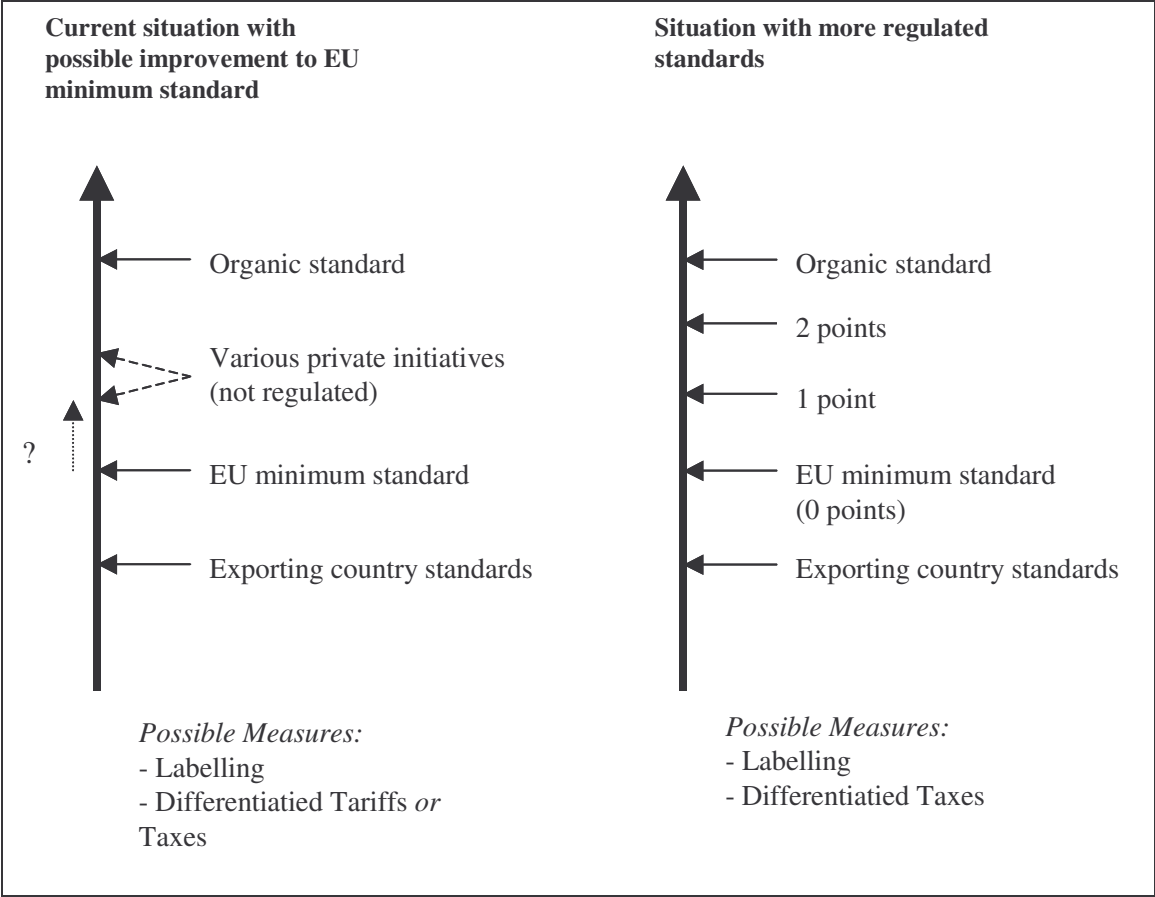
The current situation is presented in the left hand side of Figure 1. The vertical line represents a range of lower to higher standards of animal welfare in PPMs of meat products. This simplifies the differences in standards by ignoring the fact that animal welfare standards consist of many different elements. (For example, standards concerning the slaughtering of farm animals in other exporting

countries may be comparable with those in the EU and embodied in EU import regulations which do not though cover other aspects of animal welfare.) The legislated standards are placed along the line without attention given to relative distances at this point. Individual producers (and their supply chain partners) are distributed along the line. In other words, not all European producers are only complying with the minimum EU standard (which also varies in practice in its implementation from one member state to another); some produce at a higher standard. Producers in developing countries also vary in the standard they actually achieve, although little has been documented about this variation.

Regulating the labelling of improved standards is depicted on the right-hand side of Figure 1. Two situations can be distinguished: one in which measures concentrate on improved animal welfare levels in foreign countries to reduce the gap with European standards, and one in which measures aim, in addition, to stimulate improvements in standards practised in European production above the minimum required by law (EC 2002). A supervised (or regulated) and compulsory labelling scheme could be applied in either situation to provide consumers with more information and hopefully influence them to purchase meat produced with higher levels of animal welfare.¹ In the first situation, labels could distinguish between products that do and do not meet the European minimum standard. Such labelling could be regulated and supervised by government authorities, but left as a voluntary decision for producers, or be made mandatory. This labelling is intended to stimulate foreign producers to adopt EU standards by making it clear to consumers that such products differ from those produced in the EU. In the second, supervised labelling of products that meet standards higher than the minimum required could be introduced, such as has been suggested in the Netherlands with a varying index of animal welfare on meat products (INGENBLEEK 2004). The aim of such labelling is to also provide an incentive for domestic producers to increase animal welfare standards above the minimum requirement

Figure 1 Options with respect to improving PPM standards

¹ GOLAN ET AL. (2000) elaborate a taxonomy of labelling schemes according to the extent of regulation.



In addition to providing more information to consumers by means of labelling, there is also the possibility of using financial mechanisms such as taxes or tariffs, to reduce the price difference that consumers of products with higher standards must pay. Existing or new taxes and/or tariffs could be differentiated according to PPM standards to compensate for higher production costs associated with improved standards. Differentiating tariffs means either a lower, i.e. preferential, import duty (relative to the current applied rates) for meat imports meeting the EU minimum standard, a higher duty for those not meeting the EU minimum standard, or a combination of both. Similar differentiation is conceivable with a tax-based measure, such as excise taxes. Whereas differentiated tariffs would aim to improve standards in foreign countries (the first situation), a differentiated tax measure could also be used to stimulate improvements in animal welfare in production within the EU. In practice, differentiated taxes or tariffs would be applied in combination with some form of labelling, as a means of communicating to the consumer the purposes of the policy.

3 WTO rules and the legal admissibility of the various measures

Although the intended aim of the measures is to increase levels of animal welfare in meat production in the EU and countries exporting to the EU, they will probably affect trade flows and so their consistency with WTO rules and principles needs to be investigated. Each of the measures can be seen as discriminating between different types of traded products, whether between meat produced in the

EC and elsewhere, or between meat produced in various non-EC countries. The measures could therefore be subject to a challenge in the WTO's dispute settlement procedures. Three possible defences are conceivable including:

1. Meat products with higher standards of animal welfare are not 'like' other meat products. If the products are considered to be different, then measures may be applied to one group of products and not to the other. WTO panels assess whether products are 'like' on the basis of criteria that include the properties, nature and quality of the products, its end-uses, consumer tastes and habits, and tariff classification;
2. The measures are permitted under the WTO SPS Agreement as necessary to protect animal health and/or the WTO TBT Agreement as the least trade restrictive means of achieving the goal of improving animal welfare. Trade-distorting measures may be permitted under the SPS Agreement if they are necessary for the protection of animal health, plant health or food safety. The TBT Agreement requires that regulations do not restrict trade more than is necessary to achieve the stated aim;
3. The measures are necessary to protect public morals and animal health, and so can be justified under Article XX GATT which allows, under certain conditions, measures to deviate from the general principles of the GATT.

Detailed analysis of WTO rules and recent dispute cases indicates the first defence has little likelihood in succeeding.² Meat products produced with different levels of animal welfare would probably be considered as 'like' products. Although it should be pointed that the interpretation of the concept of 'like product' under Article I:1 and Article III GATT in dispute settlement proceedings is not a model of consistency. It is not a model of clarity either: in theory, panels and the Appellate Body adhere to criteria developed more than 30 years ago, but in practice, they bend these criteria to suit the purpose of curbing protectionist measures or measures perceived as such by them (MELLONI, 2005, REGAN, 2002, ROESSLER, 2003). To determine whether products are 'like', WTO panels and Appellate Body use the criteria developed by the Report of the Working Party on Border Tax Adjustments (GATT, 1970, p. 102).

- Properties, nature and quality of the product;
- End-uses of the product;
- Consumers' tastes and habits;
- Tariff classification of the product.

² Space limitations do not permit full inclusion of the legal analysis in this version of the paper but it can be supplied upon request and could easily be incorporated in the final version.

While the first, and in particular the third criteria might seem to allow for a distinction between products based on animal welfare in production methods, this still seems unlikely, partly because of qualifications that have been elaborated by the Appellate Body in the past. Most importantly, the extent to which products are competing is also considered, demonstrated for example in the case *Japan – Taxes on Alcoholic Beverages* (WTO 1996). The case law³ shows that panels and the Appellate Body are fully aware of, and prepared to prohibit, indirect discrimination whatever form it takes. One would thus have to go to arguments other than those based on the traditional criteria.

The second defence may be upheld but depends, in the case of the SPS Agreement on scientific evidence demonstrating that the measures protect animal health, by preventing risk of pests and diseases. But this has not yet been generally accepted. The TBT Agreement would, in the absence of agreed international standards on animal welfare, require that the EU standards can be justified on the basis of a scientific assessment. This defence, which follows from the current lack of internationally recognised standards for animal welfare, may well be upheld if it can also be shown that the measures are not more restrictive of trade than necessary (i.e. proportionate).

The third defence tentatively offers the strongest argument, particularly by justifying the measures as necessary to protect public morals, where it is argued and can be demonstrated that animal welfare is an issue of public morals in the EU. Article XX GATT exempts measures that are inconsistent with a substantive obligation under GATT from the prohibition of such measures, if they can be justified under Article XX. Article XX GATT does not refer to measures designed to protect the environment. This does, however, not necessarily mean that, where such measures affect trade, they cannot benefit from the exception of Article XX. Strenuous attempts are made by the WTO 'political' (as opposed to 'adjudicative') bodies to 'pigeonhole' environmental policy concerns within the existing WTO legal framework: e.g. the WTO Committee on Trade and Environment refers to the exceptions in Article XX(b), (d) and (g) as environmental exceptions.

The literature is not of much help: animal welfare and environment are often referred to as 'environment' without any analysis of the differences under Article XX GATT.

It should also be noted that the policy contemplated could come within the scope of more than one section of Article XX GATT and should, if need be, be justified by reference to more than one section of Article XX GATT. E.g. a measure restricting or even prohibiting the rearing of hens or swine in batteries could be justified as being in the interest of the health (possibly mental) of the animals or as a matter of public morals.

³ Including, among others *EC - Bananas* (WTO, 1997b); *US - Measures Affecting Alcoholic and Malt Beverages* (GATT, 1992); *US - Taxes on Automobiles* (GATT, 1994); *Chile - Taxes on Alcoholic Beverages* (WTO, 1999); *EC - Conditions for the Granting of Tariffs Preferences to Developing Countries* (WTO, 2004a); *EC - Measures Affecting Asbestos and Asbestos-Containing Products* (WTO, 2001); *Korea - Measures Affecting Imports of Fresh, Chilled and Frozen Beef* (WTO, 2000b).

No conclusions can be drawn from earlier dispute settlement proceedings. Until recently, only one panel (a GATT panel) had been asked to interpret Article XX(a).⁴ In the recent US-Gambling case, the panel avoided the issue but the Appellate Body ruled on it.⁵ This is the first WTO case that broadly addresses exceptions relating to 'public morals'.⁶ It implies, that in order to rely on 'public morals' exception under Article XX, one needs to establish: first, that the measures challenged comes within the scope of Article XX (a) (the measure is 'designed' and 'necessary' to protect public morals) and second, that the measure satisfies the requirements of the 'chapeau' analysis of Article XX (i.e. is not a 'disguised restriction on international trade' or is not 'a means of arbitrary or unjustifiable discrimination').

In the US - Gambling case the Appellate Body affirmed that moral concerns such as under-age gambling, fraud, compulsive gambling might justify introducing trade barriers. It upheld the US's reliance as the GATS clause paralleling Article XX GATT. Therefore, unilateral action based on moral arguments can be taken by a Member. However it needs to be carefully scrutinized, consistently applied as to not put only imported products in a trade-disadvantaged position. According to the literature, it is probably safe to assume that animal welfare protection is an issue of public morals (NIELSEN 2005). In light of the Appellate Body report in US - Gambling, one would agree: one may expect WTO panels and the Appellate Body to display considerable deference for what a Member considers as, and shows to be, a matter of public morals.

Recourse to the exception of Article XX is subject however to the conditions set out in the 'chapeau' of that Article: the measures are not applied in a manner which would constitute 'a means of arbitrary or unjustifiable discrimination' or 'a disguised restriction on international trade'. In one of its first cases the Appellate Body made clear that the 'chapeau' analysis is the final test to ensure that the exceptions of Article XX are not abused and that it is a test of measures as applied.⁷ Any differences in treatment between imported and domestic meat, if any, will need a solid justification, as shown in US - Gambling. Moreover, in US - Shrimp⁸, the Appellate Body considered certain due process criteria, such as transparency, predictability or 'good faith' effort in negotiations also as important in this respect. In this regard, beginning with some form of a labelling requirement, preceded by transparent dialogue with trading partners, is more likely to be upheld.

⁴ US - Measures Affecting Alcoholic and Malt Beverages, (GATT, 1992); the panel ducked the issue. In Tuna-Dolphin, (GATT, 1991, n. 26), the representative of Australia argued that Art. XX (a) could justify measures regarding inhumane treatment of animals, but the panel did not address this issue.

⁵ US - Measures Affecting the Cross-boarder Supply of Gambling and Betting Services, (WTO, 2005a)

⁶ The case between the United States and Antigua concerned US provisions totally banning online gambling. Although the case fell under GATS (General Agreement of Trade in Services), both of the GATS and GATT Agreements pursue the same objectives, use similar language, therefore, in accordance with Appellate Body reasoning, the case is relevant for the 'public morals' issue considerations under GATT as well.

⁷ United States - Standards of Reformulated and Conventional Gasoline, (WTO, 1996a).

⁸ US - Shrimp, (WTO, 1998b).

The likelihood of a case being brought to the WTO would also differ among the various measures. Labelling has the least chance of leading to a complaint, as well as the greatest chance of being upheld in a dispute settlement procedure. But while differentiated tariff reductions or differentiated tax measures could more quickly be claimed as not consistent with Articles I or III GATT, a defence of such measures under Article XX GATT may still have a good chance of succeeding. The next section turns to a discussion of the likely effects of the various measures.

4 Effectiveness

The analysis of the likely effects of the three types of measures is undertaken here primarily in a qualitative sense and summarised in Table 1. Predicting the effects more precisely in terms of relative shares of various segments of the meat market, and thus in raising animal welfare in meat production, is possible only with more detailed analysis of consumer preferences and cost considerations in raising standards. Modelling these considerations is not a straightforward task. Some of the points made in the discussion below are illustrated in a simple model of vertical product differentiation adapted from Bureau et al (1998) and presented in the Appendix. But that framework is still not sophisticated enough to capture all the arguments made here in terms of expected reactions among consumers or, in particular, foreign producers.

Table 1 Comparison of various measures

<i>Measure</i>	<i>Domestic Production</i>	<i>Imports</i>	<i>Prices</i>	<i>Average PPM Standard (Domestic vs Foreign)</i>	<i>Implementation Issues</i>
<i>Labelling</i>					
- for products meeting EU minimum standards	Little effect	Likely to be little effect	At most small increase	D: no change F: moderate/ considerable improvement	- Assessing conformity of standards in exporting countries - Rules for labelling of processed products
- for higher standards (e.g. point system)	Little effect	Likely to be little effect	At most small increase	D: little/moderate improvement F: moderate/considerable improvement	SAME AS ABOVE
<i>Tariffs</i>					
- Higher tariffs for products NOT meeting EU standards	Small increase	Small decrease	Small increase	D: no change F: considerable improvement	- Determining level - Collection measures (at border) - Need to

<i>Measure</i>	<i>Domestic Production</i>	<i>Imports</i>	<i>Prices</i>	<i>Average PPM Standard (Domestic vs Foreign)</i>	<i>Implementation Issues</i>
					negotiate unbinding of rates
- Lower tariffs for products meeting EU standards	Small decrease	Small increase	Small decrease	D: little/no change F: considerable improvement	- Determining level - Collection measures (at border)
<i>Taxes</i>					
- Tax increases of larger amounts for products with lower standards	Decrease	Decrease	Increase	D: considerable improvement F: considerable improvement	- Need new special excise tax - Preferably for all of EU - Designing consistent incentives for all segments including foreign and organic
- Tax decreases/ rebates of larger amounts for products with higher standards	Increase	Increase	Decrease	<i>SAME</i>	<i>SEE ABOVE</i> + - Increase in public spending of undetermined duration (subsidy)

4.1 Labelling

The effect of labelling on foreign producers to increase PPMs related to animal welfare to comply with minimum European standards clearly depends on how consumers react to this information. There are various possible scenarios and situations, depending on how such labelling is implemented. In the Appendix, a relatively simple model shows that labelling gives foreign producers a strong incentive to upgrade to the minimum standard. Domestic producers are likely to use this differentiation in their marketing strategies, pointing out the added level of animal welfare. A certain number of foreign producers, perhaps under pressure from their domestic import and retail partners, are likely to do what is necessary to increase their standards in order to qualify for the minimum standard.

Providing new additional standards, such as a range of one or more points, above the existing two standards, would likely increase the confidence of consumers in the information provided on

existing meat product labels. This applies in particular to meat producers who are attempting to differentiate their products on the basis of animal welfare in production, without producing to the organic standard which also includes requirements concerning animal welfare. Indeed the organic segment of the market is currently regulated with a voluntary labelling scheme. Consumers who are attracted by meat products meeting a higher standard (though not necessarily the organic one) are likely to trust that the label, when this standard is officially recognized and certification is regulated by law (GOLAN ET AL. 2000).

The extent to which animal welfare standards improve in meat production, either in foreign countries or within the EU, thus depends largely on the reactions of consumers to the differentiated products and the associated price difference. For the first labelling option (minimum EU standard), the question is to what extent there are consumers who would like to purchase meat products that score better on animal welfare but who are much less concerned about other attributes of organic meat products, such as the type of feed used. The simple model in the Appendix illustrates the importance of consumers' perceptions of the difference between the two quality standards. If foreign producers respond though by also seeking to enhance their cost advantage, then the effects of such labelling on the promotion of animal welfare might be limited, particularly where most consumers do not perceive such a large difference.

For the second labelling situation (a point system for improved standards), the benefit to consumers from more choice through a point system will relate to how much this new segment of the market grows and also on the perceptions of products that are unlabelled. Growth in the market for higher standard products will be determined by the proportion of consumers who are willing to pay somewhat more for an improved standard of animal welfare, but are not interested in purchasing all the attributes attached to organic production. There are reasons for expecting this to be a limited segment of the market. As mentioned, a certain number of consumers who are concerned about purchasing animal-friendly meat and are willing to pay more for this already have a choice that meets their concerns. Indeed, the situation with voluntary labelling of hen-friendly egg production standards would seem to support this expectation, but there is still very little research on which to base such predictions. On the other hand, a relatively stronger effect may be observed with labelling of minimum standards. But this does not serve, in the first instance, to raise standards in the EU.

Labelling of meat meeting the EU minimum standard can thus be expected to have some positive effect on the level of animal welfare in PPMs in exporting countries. This would also be the case for a regulated (supervised) labelling scheme for one or more gradations of better PPMs, such as with an animal welfare index. But the extent to which such a scheme would improve animal welfare in the EU or other countries is harder to predict. Based on existing, though limited, research on consumers, relatively little demand for differentiated meat products embodying higher standards of animal welfare in the EU can be expected (BEEKMAN ET AL. 2002). Many consumers expect that the

minimum standard will be set as 'sufficient' standard. Nonetheless such a scheme would probably incorporate the same positive effects on foreign producers as the simpler labelling of a minimum standard which would be either implicitly or explicitly included in the more elaborate scheme.

4.2 Differentiated Tariffs

Two policy measures have been proposed for reinforcing labels and standards with financial measures: differentiated tariffs and differentiated taxes, in particular consumer taxes. The main difference between tariffs and taxes is that tariffs would be a border measure differentiating only between domestic and foreign products according to animal welfare in production methods, whereas taxes would apply to all products on the domestic market. Differentiated tariffs or taxes should really only be contemplated together with the use of mandatory labelling and standards. With such measures, producers, particularly of products that meet standards qualifying for lower tariff or tax rates, will have a strong incentive to convey this information to consumers. The latter would probably benefit from a labelling scheme that is regulated in order to ensure the provision of clear and trustworthy information. Differentiated tariffs or taxes can thus be seen as serving to enhance the effectiveness of a labelling scheme.

The additional effects of tariffs will depend on options or scenarios concerning the nature of the differentiation applied. For example, if tariffs for meat products are differentiated according to two or more standards of animal welfare in production, then this could, in theory, be achieved by *reducing* the tariff rate for products that meet a higher standard, or by *increasing* the tariff rate for existing products.

What would be the effect of higher import tariffs in the EU on meat products that do not meet the EU's minimum standard? This would probably reduce the market share of such products as illustrated in the simple model in the Appendix. Foreign producers would have an even greater incentive to adopt EU minimum standards, depending on the size of the tariff. Given the general cost advantages enjoyed by such producers for the basic factors of production (land, labour, energy, etc.), it could be expected that they would be able to adopt such standards without too much difficulty within a few years.

Higher import tariffs will raise market prices to some extent, depending on the extent and pace of adaptation by foreign producers, and thus benefit domestic producers whose market share may increase. Consumers will pay higher prices for meat, though, according to the extent to which price increases are passed on through the marketing chain.

If on the other hand, import tariffs were lowered for products that do meet the EU's standard, then it can be expected that more foreign producers, either on their own initiative or under pressure from their importing partners, would adjust their production standards in order to take advantage of the

lower tariff. This would lead to increased market share for imported meat products, relative to domestic products. Lowering tariffs effectively reduces the cost of serving the European market for foreign producers who can meet the standard. The average price level would also decline, but the extent to which this is passed on to consumers depends on market structure and the nature of competition in the processing, wholesaling and retail sector.

From a longer term point of view, this does seem to imply permanently lowering the applicable tariff for meat products in general. If it is intended that foreign producers would move to adopt European minimum standards over time, spurred on by the lower tariff, then the promise of this lower tariff would have to be relatively certain. In other words, foreign producers would expect some assurance that it would not be raised again.

In order to have an effect on the decisions of foreign producers, a tariff increase or decrease would have to be greater than the additional cost for producers of meeting the EU's standard. Producers vary considerably in their cost structures and levels, thus a chosen level will be an incentive to some lower cost producers but not to others. Determining an appropriate level requires data on such additional costs and would be a complicated task. An estimate of the additional costs of meeting EU standards for European producers could provide a useful starting point. Given the overall cost advantage of foreign producers, their additional costs are likely to be no higher than those of European producers. This means that a tariff based on European producers' additional costs would likely have an effect on foreign producers, leading many of them to increase their PPM standard. On the other hand, this may be higher than necessary, or not proportionate in WTO terms, and possibly require justification in an eventual WTO dispute resolution process.

These points should be borne in mind when considering the distribution of the effects of differentiated tariffs on domestic versus foreign producers. The initial effects of a higher tariff, for example, might favour domestic production. But if the tariff has its intended effect of providing an incentive for a substantial portion of foreign producers to increase their standards, then these producers are likely to regain market share.

It is also possible to combine tariff reductions for products meeting EU production standards with increases above current levels for those products not complying. This means that the tariff increases and decreases for the respective product types would be less than if there only a tariff increase or only a tariff decrease. It may be possible to do this in such a way that leads to relatively neutral effects in terms of market shares and prices, as well as tariff revenues. But over time foreign producers will adjust and other market factors will change, meaning that the neutral character would likely only be temporary, with the chances being that the balance will shift towards an overall average tariff reduction.

A higher tariff for products not meeting the EU minimum standard would probably require a renegotiation of the bound rate for such products with trading partners at the WTO. This clearly poses more difficulties than lowering a tariff for products that do meet the minimum standard, which would likely lead to fewer complaints from exporting countries. A further complication with differentiated tariffs is that it would be necessary to incorporate this distinction into ongoing discussions within the Doha Round to ensure that the incentive remains in the next agreement on agriculture.

Implementing differentiated tariffs also involves border measures to check the standard of imported meat products. While this may only involve a verification of labels, the extent to which such tasks may pose complications for custom agencies should probably be investigated further.

Differentiated tariffs primarily affect foreign products and could be used to provide greater incentives to meat producers in countries exporting to the EU to adopt its minimum standard for animal welfare. The additional effects of differentiated tariffs on market shares and prices is likely to be modest while a considerable improvement in standards among exporters could probably be expected. Tariffs could be either increased for products not meeting EU standards or decreased for compliant products. The principal difficulties with tariffs concern the renegotiation of bound rates in the case of tariff increases, or the increased competition on the domestic market in the case of decreases.

4.3 Differentiated taxes

Differentiated taxes (or purchase rebates) could provide much stronger incentives for producers in the EU and other countries to further improve their animal welfare standards in PPMs. For policy makers, taxes, as opposed to trade measures, may appear to offer an easier way to avoid conflict with WTO rules. But designing and implementing such a system poses even more difficulties, some of which may be insurmountable. Setting different VAT rates would be difficult to achieve, requiring decision at EU level, and may even be overturned by the European Court of Justice which has ruled that differential VAT rates for competing substitute products are not permissible and would violate the principle of fiscal neutrality. Furthermore, the current rates applicable, as well as the agreed ranges, would restrict the size of the differentiation achieved. Thus, a new tax would probably have to be created, and with commitment from many if not all EU members. A consumer rebate (proposed in some countries), paid at the point of sale, may be a possibility. But ensuring that incentives were both effective and consistent among the various standards proposed, including existing organic standards, appears challenging. Consumer rebates also raise the possibility of an additional and lasting demand on public finances.

5 Conclusion

Some tentative policy recommendations for measures to improve animal welfare in farm production can be formulated based on the combination of legal and economic analysis. Labelling of meat

products that distinguishes between those that do and those that do not meet the European standard may be a logical starting point. The extent to which this is effective could be monitored. Then, at a later stage, if the results, in terms of increased market share for 'sustainable' meat, are not judged to be satisfactory, a financial instrument might be considered. Given the greater difficulties posed by a measure based on taxes or rebate, tariff differentiation would be a better place to start. In this sequential manner, a stronger case could be made that tariffs were a necessary and proportionate measure. And tariffs would, in any case, have to be accompanied by some form of labelling.

With respect to providing incentives for domestic producers to improve animal welfare standards, a regulated labelling scheme might also be the better place to begin. The expected effects in terms of improvement of animal welfare are likely to be more modest than for labelling of products that only meet EU minimum standards. In this case though, the potential for reinforcing the labelling scheme with differentiated taxes, or some other fiscal measure, seems limited. This is due less to potential conflicts with WTO rules, but more to implementation difficulties and precedents under European law. With respect to possible conflicts, note that a labelling scheme is less likely to incur a complaint and, even in such an eventuality, more likely to be upheld in a dispute settlement process as being less trade-distorting.

The proposed sequence of first labelling, with reinforcement possibly coming later by means of a financial incentive also offers more opportunities for individual member states to undertake their own initiatives, while perhaps negotiating a common or joint approach across the EU. Individual countries, or a small group of neighbouring countries, could devise and implement labelling schemes of either type suggested above. It should be born in mind however that subsequent harmonisation of labelling initiatives across countries could be tedious. Both differentiated tariffs or taxes, on the other hand, are measures that should be implemented at European level. Import tariffs are a matter of EC responsibility. A tax measure could be implemented nationally but could then lead to unintended distortions in trade flows within the EU, and also presents difficulties in border zones where consumers can easily purchase in neighbouring countries. However, pilot initiatives with tax measures may perhaps be considered at (sub)national level, in order to investigate their possible effectiveness.

A number of issues can be identified for further analysis to inform policy makers and other stakeholders, before any decisions are taken, including:

- Quantitative analysis for specific meat products of the expected effects of the measures incorporating existing data and scenarios concerning consumer responses and the costs of meeting stricter standards both domestically and foreign;
- The possibilities of labelling of different standards, including mechanisms necessary for controlling standards in exporting countries;
- The feasibility of implementing a differentiated tariff by the customs agencies;

- Similarly, the fiscal possibilities for a differentiated tax or rebate, which is also being discussed in some countries in relation to organically-produced products.

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7 Appendix

A relatively simple model of vertically differentiated products in international trade can be used to illustrate the basic effects of labelling and tariffs on market prices, quantities and welfare measures. For this purpose, the model developed by BUREAU ET AL (1998) for illustrating the EU-US trade dispute in the late 1990's on hormone-treated beef, is modestly adapted. The case of hormone-treated beef is fairly similar to animal welfare as a non-product related PPM, although as BUREAU ET AL. point out, there is some evidence that consumers can detect a difference in appearance or flavour between hormone-treated and non-hormone treated. Despite this, they chose to elaborate a model for hormone treatment as a credence good in which such a distinction cannot be made by consumers.

In the model, consumers are assumed to vary in terms of their preference for the level of animal welfare in meat products. This preference is captured by the parameter θ which is distributed uniformly in the interval $[0,1]$.⁹ The utility that consumers obtain from consuming one unit of meat product of quality k is given by θk and net utility is therefore $\theta k - p$ where p is the price of one unit.¹⁰ It is possible that some consumers will choose not to purchase any meat at a given p , thus allowing for overall market expansion and contraction under the various scenarios considered.¹¹

Meat can be produced at two different perceived quality levels k_1 and k_2 , where k_2 is the higher level corresponding to the minimum required standard in the EU. The lower quality k_1 represents the level of animal welfare in meat production in the foreign producing country that exports to the EU, with $k_1 / k_2 = \beta \in (0,1]$. In this simple setup, foreign and domestic farmers are restricted to producing their respective quality level¹² and there is no organic quality, although this would serve to reinforce the points argued in the main text. In the base case, consumers have no means of observing the quality level in the meat purchased. BUREAU ET AL (1998) introduced the distinction between perceived and expected quality, with the latter represented here by k^* . In the absence of information concerning the level of animal welfare or effectively any means of distinguishing between domestic and foreign-

⁹ The distribution of consumers is thus normalized without loss of generality. Note that this is one of the strongest assumptions made in the model and interesting extensions involving other distributions of consumer preferences could be investigated here (as has been undertaken in the the case of the classic Hotelling model of strategic choice in spatial differentiation; see ANDERSON, GOEREE AND RAMER (1997).

¹⁰ The fact that consumers are assumed to purchase only one unit is retained for simplicity and could only be extended by adopting a more sophisticated utility function. SYMEONIDIS (2003) has recently pointed out that the simple linear function used in models such as the one presented here may well be responsible for the results. In the current paper, note though that there are no strategic decisions being made, and thus the simple framework, which yields linear demand functions, is less susceptible to this critique.

¹¹ In other words, the market is not covered using the terminology of SHAKED AND SUTTON (1982), further elaborated by WAUTHY (1996).

produced meat, consumers expect that meat purchased will correspond to a quality level k^* that is a average of the k_1 and k_2 , weighted according to market shares:

$$k^* = \frac{S_1(p)}{S_1(p)+S_2(p)}k_1 + \frac{S_2(p)}{S_1(p)+S_2(p)}k_2 \quad (1)$$

where S_i corresponds to supply of quality i , with $i \in \{1,2\}$. Supply in each country is modelled as a perfectly competitive constant marginal cost sector with the following aggregate supply functions and expressions for producer surplus:

$$S_i(p) = p / c_i \quad (2)$$

$$PS_i = p q_i - \frac{1}{2} c_i q_i^2 . \quad (3)$$

Marginal cost of producing quality i is thus c_i with $c_1 / c_2 = \gamma \in (0,1]$ and γ represents the relative cost advantage of foreign producers, including the lower cost associated with a reduced level of animal welfare.

In the baseline situation, the consumer who is indifferent between purchasing one unit of meat of expected quality k^* or no meat at all is characterised by a value of θ designated as θ^* where $\theta^* = p / k^*$. Consumers distributed in the interval $[0, \theta^*]$ purchase no meat at all and those in the interval $[\theta^*, 1]$ purchase each one unit, leading to the demand function $D(p) = 1 - \theta^* = 1 - p / k^*$, given the uniform density of consumers. Total supply is $S(p) = S1(p) + S2(p)$. Equating supply and demand yields the equilibrium price, p (which is the same for both qualities of meat products as these cannot be distinguished), and the quantities supplied by foreign and domestic producers, respectively q_1 and q_2 :

$$p = \frac{c_1 c_2 k^*}{c_1 c_2 + k^* (c_1 + c_2)} \quad (4)$$

$$q_1 = \frac{c_2 k^*}{c_1 c_2 + k^* (c_1 + c_2)} \quad (5)$$

$$q_2 = \frac{c_1 k^*}{c_1 c_2 + k^* (c_1 + c_2)} \quad (6)$$

Following BUREAU ET AL (1998), relatively simple expressions can be derived for consumers and producers surpluses, given the linear nature of the demand and supply functions:

¹² BUREAU ET AL. (1998) analyse some scenarios in which domestic producers are permitted to produce at the foreign quality standard as well. In the case of the current model, the more interesting possibility is to allow foreign farmers to produce at the European standard, but this is the subject of ongoing work.

$$PS_1 = \int_0^{q_1} (p - c_1 q) dq = \frac{c_1 c_2^2 (k^*)^2}{2[c_1 c_2 + k^*(c_1 + c_2)]^2} \quad (7)$$

$$PS_2 = \int_0^{q_2} (p - c_2 q) dq = \frac{c_2 c_1^2 (k^*)^2}{2[c_1 c_2 + k^*(c_1 + c_2)]^2} \quad (8)$$

$$CS = \int_{\theta^*}^1 (\theta k^* - p) d\theta = \frac{(k^*)^3 (c_1 + c_2)^2}{[c_1 c_2 + k^*(c_1 + c_2)]^2} \quad (9)$$

When labelling of animal welfare quality is introduced, then consumers receive credible information concerning whether meat is produced at quality level k_1 or k_2 ; the difference between perceived and expected quality (k^*) disappears. The situation here is taken as a relatively simple case where government regulates the labelling by setting the standard and providing the legal framework for a system of auditing or verification. This does not necessarily imply that the government undertakes such verification itself; an independent body may be endowed with such responsibilities and the meat producers could organize the performance of this activity themselves, within the legal framework set by public authorities. Note that in this simple model, the label is one that distinguishes between whether meat has been produced at the EU minimum standard or not, and as such comprises an almost perfect information form of combined positive and negative labelling for illustrative purposes.

The labelling of animal welfare standard segments the market with each quality level being sold at its own price. Given the assumptions of the model, this means that $p_2 > p_1$. Now there are two indifferent consumers at any set of possible prices, one who is indifferent between consuming quality k_1 or no meat at all, denoted $\theta_{0,1} = p_1^L / k_1$, and another indifferent between consuming quality k_1 and k_2 , denoted $\theta_{1,2} = (p_2^L - p_1^L) / (k_2 - k_1)$, where the superscript L denotes prices under the labelling scenario. The two demand functions are now

$$D_1^L(p_1^L) = \frac{p_2^L - p_1^L}{k_2 - k_1} - \frac{p_1^L}{k_1} \quad (10)$$

$$D_2^L(p_2^L) = 1 - \frac{p_2^L - p_1^L}{k_2 - k_1} \quad (11)$$

Equating supply and demand in both market segments and solving the system for p_1^L and p_2^L leads to the following expressions for equilibrium quantities and prices:

$$q_1^L = \frac{c_2 k_1}{(c_1 c_2 + c_1 k_2 + c_2 k_1 + k_1 k_2 + k_1^2)} = \frac{\beta c_2 k_2}{[\gamma c_2^2 + c_2 k_2 (\beta + \gamma) + \beta k_2^2 (1 - \beta)]} \quad (12)$$

$$q_2^L = \frac{c_1 k_2 + k_1 k_2 - k_1^2}{(c_1 c_2 + c_1 k_2 + c_2 k_1 + k_1 k_2 + k_1^2)} = \frac{[\gamma c_2 k_2 + \beta k_2^2 (1-\beta)]}{[\gamma c_2^2 + c_2 k_2 (\beta + \gamma) + \beta k_2^2 (1-\beta)]} \quad (13)$$

$$p_1^L = c_1 q_1^L = \gamma c_2 q_1^L \quad (14)$$

$$p_2^L = c_2 q_2^L \quad (15)$$

Similarly, the following expressions for producers and consumers surplus can be derived (which correspond to an alternative formulation of the expressions derived by BUREAU ET AL (1998)):

$$PS_1^L = \frac{\beta^2 \gamma c_2^3 k_2^2}{2[\gamma c_2^2 + c_2 k_2 (\beta + \gamma) + \beta k_2^2 (1-\beta)]^2} \quad (16)$$

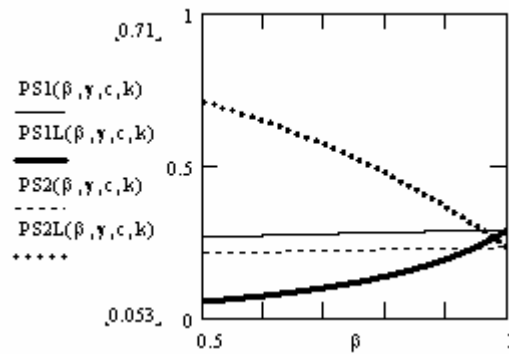
$$PS_2^L = \frac{c_2 [\gamma c_2 k_2 + \beta k_2^2 (1-\beta)]^2}{2[\gamma c_2^2 + c_2 k_2 (\beta + \gamma) + \beta k_2^2 (1-\beta)]^2} \quad (17)$$

$$CS^L = \frac{p_2^L - p_1^L}{2k_2(1-\beta)} + \frac{(p_1^L)^2}{2\beta k_2} + \frac{k_2}{2} - p_2^L \quad (18)$$

Note that the expression for CS^L can also be written entirely in terms of β , γ , c_2 and k_2 but does not simplify to a neat expression.

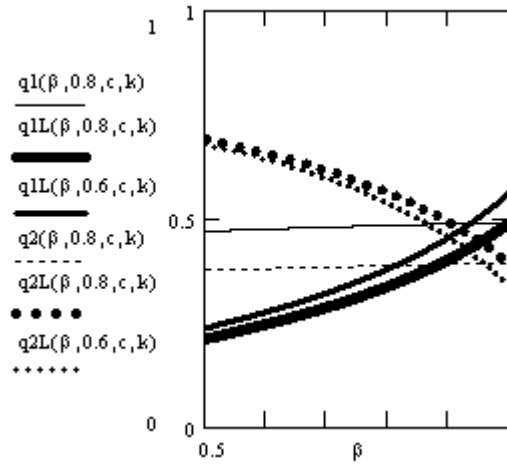
Figure A1 illustrates how producers surplus changes under labelling for both foreign and domestic producers, compared to the base situation. With the chosen values, the situation changes from one where domestic and foreign producers enjoy almost the same profits. With labelling domestic profits rise while foreign profits fall, with these changes decreasing as β approaches one, or as the perceived quality difference declines between the two standards of meat production.

Figure A1: Producers surplus for domestic (2) and foreign (1) producers under the base scenario and with labelling ($\gamma = 0.8$, $c_2 = 3$, $k_2 = 10$)



There is thus a considerable incentive for foreign producers to invest to meet the foreign (EU) standard. While that is not modelled explicitly here, it is instructive to see what happens if instead, foreign producers are able to further improve their cost advantage which may be an alternative reaction (or simply a continuation of current trends). This is illustrated in Figure A2 which shows now quantities sold by domestic and foreign producers before and after labelling, with an added scenario in which γ is reduced from 0.8 to 0.6. For higher values of β around approximately 0.9, such a relative cost reduction almost entirely compensates for the market share lost due to the introduction of labelling. Recall that the relative quantity of meat produced according to the higher EU standard could be seen as one objective of policy.

Figure A2: Quantities produced by domestic (2) and foreign (1) producers under the base scenario and with labelling ($\gamma = 0.8$, $c_2 = 3$, $k_2 = 10$, including a further reduction of $\gamma = 0.6$)



BUREAU ET AL (1998) did not examine the possibility of using financial instruments such as differentiated tariffs, in addition to labelling. It is however relatively straightforward to add a specific tariff, denoted by t , to the model, leading to the following equilibrium prices and quantities:

$$p_1^{Lt} = \frac{c_1 c_2 k_1 + t k_1 (c_2 + k_2 - k_1)}{c_1 k_1 + (c_2 + k_2 - k_1)(c_1 + k_1)} \quad (19)$$

$$p_2^{Lt} = \frac{c_2 (p_1 + k_2 - k_1)}{(c_2 + k_2 - k_1)} \quad (20)$$

$$q_1^{Lt} = \frac{p_1^{Lt} - t}{c_1} \quad ; \quad q_2^{Lt} = \frac{p_2^{Lt}}{c_2} \quad (21)$$

Consumers and producers surpluses can also be calculated as before. Figure A3 illustrates the additional effects of the tariff on the surplus of producers in the foreign country, as well as illustrating the tariff revenue.

Figure A3: Foreign producers surplus under the base scenario, with labelling and a differentiated tariff and government tariff revenue ($\gamma = 0.8, c_2 = 3, k_2 = 10$)

