Analyzing the impacts of mandatory country of origin labeling in EU pork and poultry sectors on markets, cost of production and trade

Roel Jongeneel and Willy Baltussen*)

LEI Wageningen-UR, The Hague,

Paper prepared for presentation at the 14th EAAE Congress in Lubljana, August 26-29, 2014

This paper benefitted from the Study on mandatory origin labelling for pre-packed unprocessed meat of pigs, poultry and sheep & goats (AGRI-2012-EVAL-01) funded by the European Commission

Abstract
In this paper, we look at country of mandatory country of origin labelling (MCOOL) that is implemented for meat in the European Union (EU) as outlined in Regulation No 1169/2011 and might be extended to other products. A framework is developed to assess costs and benefits and market impacts (trade flows, competitiveness). The framework is applied to the EU meat case. Results indicate that the impact of origin labeling on costs range between 6€/t and 73€/t, while the impacts on net trade at member state level are in general limited, with a few exceptions (vary from 0.1 to 10.3 per cent).

Keywords: country of origin labelling, meat sector, competitiveness, international trade

1. Introduction

Recent years have shown that both in the US and in the EU there is an increasing reliance to mandatory country of origin labeling (MCOOL) labeling. As regards the US the 2002 Farm Bill contained a provision mandating country of origin labeling of certain unprocessed foods (beef, pork, lamb, fish, seafood, peanuts, fruits and vegetables) sold through non-small grocery stores which has been effective since September 30, 2004. For the EU Regulation (EU) No 1169/2011 on the provision of food information to consumers provides for mandatory indication of country of origin or place of provenance for fresh and pre-packed meat of pigs, poultry, sheep and goats, as from 13 December 2014. The current debate in the EU is about the possibility of also introducing MCOOL for other products like dairy products.

Because of the growing competition on international markets, consumer sensitivity to origin (e.g. my country first-sentiments) has become a relevant issue for commercial managers as well as policy makers. Japan, for example, has already a MCOOL for all meat imports since 1997. The basic concept of origin labeling appears to be appealing to specific groups of consumers, producers and policy makers as is reflected in the efforts made in the protected designation of origin (PDO), the protected geographical indication (PGI) of products, and the voluntary country or region of origin labels that are used. Where PDO and PGI labels signal certain "quality" characteristics (e.g. product authenticity), and also voluntary certification is driven by commercial (profitability) interests, mandatory labeling of country of origin is more controversial in that it may impose a costly regulation with little or no benefit for the involved sectors. Moreover it may lead to unfair discrimination of products. For this reason, for example, Canada and Mexico being major suppliers of live cattle and hogs (pigs) that are exported to the US for feeding and processing in US meat plants, were concerned that the US MCOOL requirement would adversely affect their livestock sector. After trade figures showed a drop in Canadian exports in the 2008 - 2009 period, Canada challenged the US MCOOL at the WTO level. On 19 November 2009, the WTO Dispute Settlement Body established a single panel to examine the dispute on US MCOOL, where the panel found that the origin labelling requirement is a technical regulation under the Technical Barriers to Trade (TBT) Agreement, and that it is inconsistent with the WTO obligations of the US. After the US amended its policy, Canada in 2013 again requested the WTO compliance panel because they claim that also the adjusted US labeling regulation is still unlawfully discriminating against Canadian meat products.

The EU Regulation requires the adoption of implementing acts, to be drawn up following impact assessments and consideration of options for expressing the country of origin or place of provenance, in particular with regard to each of the following determining points in the life of the animal: place of birth; place of rearing, and place of slaughter [Article 26 (9) of the Regulation]. This paper aims to provide an economic framework to analyze the impacts of MCOOL on competitiveness and trade and assess the cost and trade impact of MCOOL for fresh and frozen meat (including minced meat and cuts) of pigs and poultry in the EU-27.

The paper is organized as follows. Section 2 includes a brief literature review, which is followed by the introduction of an analytical framework for impact analysis (Section 3). Section 4 discusses the determination of the impact of MCOOL on the costs of production of pig and poultry meat products in the EU member states. Section 5 provides the results of the modelling analysis, based on the costs shocks as they came from Section 4. The paper ends with some concluding remarks (Section 6).

2. Literature

The agricultural economics literature on MCOOL addresses different aspects. A number of studies focus on estimating consumers' benefits or willingness to pay for COOL products (e.g. Ehmke et al, 200; FSA, 2010; Van Haaster-De Winter and Ruissen, 2012; SANCO, 2012). Based on these studies the general conclusion is that the consumers' willingness to pay for labeling of origin (while other product characteristics are well-assured via accepted food safety standards, voluntary certificates and quality standards)[1] is very limited and might be even easily reversible or non-durable (e.g. Disdier and Marette, 2012). Other studies try to measure the impact of COOL on the costs of production (Lust et al, 2004, Brest et al, 2004) indicating associated cost impacts having an order of magnitude varying from 0 to 5 percent. Impacts of COOL implementation on production and trade flows are addressed amongst others in Krissoff et al, 2004; Brester et al, 2004; Dinopoulos et al, 2010 and Terluin et al, 2012, mostly in the context of a partial equilibrium and net trade framework. Relatively low impacts on costs of production suggest limited impacts on trade (e.g. estimates usually in the range of 0 to 5 percent, depending on level of the supply chain (retail, wholesale, or animal finishing level)), and this is what is generally found, although exceptions are also there. As impact of origin labelling on trade differs per country and product it induces relative price changes, therewith affecting international competitiveness. As an example, for beef origin labelling resulted in increasing market share of Australia, Canada, France and the Netherlands, while the trade from Germany and Ireland was negatively influenced (Matsumoto, 2011).

3. Methodological framework

Introducing origin labeling in one country

Let the starting point be a representative agricultural producer. For notation, let Y represent its domestic supply, let p represent the market price, let D represent total domestic use (as derived from a representative domestic 'consumer') or consumption, and let $S = Y - D$ represent export supply, which in a trade equilibrium will be equal to the demand for the home country's exports B. Production of Y requires the use of inputs, some of which will be subject to regulation (X),

[1] Where this is not the case origin labels might be cues for food safety or product quality and be associated with positive willingness to pay.

while others are freely variable (*K*). Prices of *X* and *K* are *w* and *v* respectively. Some inputs (e.g. family labour, capital) might have a quasi-fixed character, but are supposed/treated here to be fixed for convenience sake. The regulatory policies (i.e. origin labeling) are modeled here as targeting a specific input use (e.g. input *X*). The input itself can be a target of regulation (e.g. the origin of the input as it follows from the specific applicable legislation) or be linked to the production process (which is indirectly targeted by regulating the input *X*). It is assumed that the (binary) regulatory constraint *R* will affect the (effective) price or cost of input *X*, or $w=w(R;\ c)$[2]. If the strictness of the regulation increases also the effective input costs will increase ($\partial w / \partial R > 0$)[3].

Using the standard duality relationship between profit maximization and cost minimization it can be shown that (see Larson, 2000, 537)

$$\frac{\partial Y(p,w,v)}{\partial w} = -\frac{\partial X(p,w,v)}{\partial p} = -\frac{\partial X(p,w,Y)}{\partial Y} \cdot \frac{\partial Y}{\partial p} \qquad (1)$$

where $Y(p,w,v)$ is the usual profit maximizing supply function, $X(p,w,v)$ is the usual profit maximizing demand for the regulated input *X*, and $X^c = X^c(w,v,Y)$ is the Hicksian (cost minimizing or compensated) input demand for a given output level *Y*. Equation (1) can be used to derive an elasticity of supply with respect to the input price *w*, i.e. η_{Yw} or[4]

$$\eta_{Yw} = \frac{\partial Y}{\partial w} \cdot \frac{w}{Y} = -\frac{\partial X^c}{\partial Y} \cdot \frac{\partial Y}{\partial p} \cdot \frac{w}{Y} = -\eta_{Yp} \cdot \eta^c_{XY} \left(\frac{wX^c}{C} \right) \left(\frac{C}{pY} \right) \qquad (2)$$

Note that the elasticity of output *Y* with respect to the input price *w* (including the cost-impact of the origin labeling) depends on:

1) the own price elasticity of output η_{Yp};
2) the elasticity of the cost minimizing input demand excluded at the reference output level Y (η^c_{XY});
3) the cost share of input *X* in total costs *C;* an
4) the share of costs in the total revenue (*pY*) associated with output *Y*.

---

[2] "Effective" here refers to the price including the relevant direct (e.g. origin label) and indirect (e.g. costs associated with channelling of product flows) costs associated with the regulation

[3] The effective input price increase may not only depend on the exact specification of the regulatory requirement *R* but may also be a function of the degree of compliance with the regulation *c*. The degree of compliance with the regulation c is likely to be itself a function of the strictness of the regulation, as well of the magnitude of the punishment/penalty (P) in case of detection to be a violation and the probability of being detected (σ). So $c = c(R,\sigma,P)$ with $\partial c / \partial R < 0$, $\partial c / \partial \sigma > 0$ and $\partial c / \partial P > 0$ with $w = w\big(R,\ c(R,\sigma,P)\big)$. In the remainder of this framework the compliance issue will be ignored (or full compliance will be assumed). For further details on compliance see Herzfeld and Jongeneel (2012).

[4] An overview of the detailed algebraic manipulations used to arrive ate the presented relationships in this paper is available from the author upon request.

The impact of the production effect on the country's trade will depend on the trade position of the country. After some further manipulation of equations it can be shown that alongside the 4 factors mentioned above also depends on:

5) the actual regulatory impact on production costs $\left(\eta_{wR} \cdot dR/R\right)$, and
6) the share of domestic production relative to exports (*Y/B*).

So far the analysis does not account for adjustment of export or world market prices due to the supply shifts. In case the country analyzed is a 'small' country, i.e. being a pure taker of the EU market or world market prices there is no reason to relax the fixed price assumption. However in the case of a 'large' country (e.g. a member state being an important supplier to the EU market), potential price effects of the regulation cannot be excluded. More generally this also holds for cases where in applied modeling so-called Armington assumptions are used. Implicitly, making such an assumption introduces heterogeneity with respect to goods (e.g. meats from different countries of origin), making the product of each country to a certain extent unique, therewith allowing countries some degree of monopoly-power (monopolistic competition). After some rearrangement and manipulation, it follows that

$$\eta_{pw} = \frac{\eta_{Yw}}{\left(-\eta_{Yp} + \eta_{Dp}\frac{D}{Y} - \eta_{Bp}\frac{B}{Y}\right)} \geq 0 \qquad (3)$$

Indicating that the increase in costs due to the restrictions imposed on the use of input X lead to an unambiguous price increase in the downstream product market.

Introducing origin labeling simultaneously in several countries

So far the impacts of origin labeling on competitiveness and trade are analysed in the context of one country introducing this legislation. The EU legislation applies to all member states and will thus lead to costs shocks in all EU countries at the same time, where the impact and order of magnitude of these costs-shocks may differ over member states depending on their specific position. In order to include the policy induced shift in the exports due to the impact the standard will have in the trade partner member state, now let B=B(p, W) be the foreign demand (or import demand function) for the home country's exports. Note that the excess demand for the home country's exports now depends on the output price level as well as on W, where W represents the foreign input price associated with the regulated input. Due to the imposed regulation this input price W is now allowed to adjust, because foreign producers also have to satisfy the regulatory standards (e.g. foreign producers also have to switch to production techniques involving a higher cost). Let's assume that the impact of the regulation causes member state specific cost increases *dw* and *dW*. Without imposing any restrictions it can be stated an extended version of (3) holds

$$\eta_{pw} = \frac{\left(\eta_{Yw} - \theta\eta_{BW}\frac{B}{Y}\right)}{\left(-\eta_{Yp} + \eta_{Dp}\frac{D}{Y} - \eta_{Bp}\frac{B}{Y}\right)} \geq 0 \qquad (4)$$

where η_{BW} represents the elasticity of the foreign country's excess demand (for imports) with respect to the price of the regulated input *W*. Moreover, η_{Bp} represents the elasticity of the foreign country's excess demand with respect to the product price *p*. It could be proven that the impact on price in this case will be larger than in (10) for any $\theta > 0$.

With domestic supply now being Y(p,w) , the impact on domestic supply due to the labeling standard is

$$\frac{dY}{Y} = \eta_{yw} \frac{dw}{w} \text{ and } \eta_{yw} = \eta_{yw}^{p} + \eta_{yp}\eta_{pw} \qquad (5)$$

where η_{yw}^{p} is the cross price elasticity, i.e. the change in *Y* due to a change in w, while keeping the output price *p* fixed. Note that η_{yw}^{p} is negative, whereas η_{yp} and η_{pw} are both positive. Note that the sign of (5) could be positive or negative depending on the situation (for example in case $\eta_{yw}^{p} > \eta_{yp}\eta_{pw}$ the impact will be negative). Combining derived price impacts, the impacts on production and the derived demand response, it can be proven that the impact on trade or the change in exports can in principle go either way (being positive or negative) depending on the behavioral responses (elasticities) and the differential cost impacts.

Consumer welfare and origin labeling

Origin labeling provides additional information to consumers on process attributes (e.g. the product the consumer buys is labeled to be manufactured in a certain member state) or product attributes (e.g. the product labeled to come from a certain country includes ingredients coming from this country). The consumer will be informed about attributes that are otherwise not easily observed by consumers (credence goods or credence good aspects). In competitive markets changes in product attributes will lead to a shift in consumer demands if and only if:

1) the attribute changes are observable to consumers
2) consumers actually care about the attribute change that is identified

Whereas origin labeling extends the attribute information set and allows consumer to use this information to discriminate between products in the buying behavior, the extent to which this might happen depends on their preferences (whether they care) with respect to the origin of production. That last issue in the end is an empirical question. However, in case consumers do not care for the origin of production, and for that reason do not see the products, although origination from different member states, as differentiated or heterogeneous products, their demand curves will not shift (i.e. the consumers indicate a zero willingness to pay). In that case it can be shown (and also formally proven) that the impact of origin labeling will be unambiguously negative to consumers, since they are faced with higher costs for the products, without the labeling providing them any noticeable benefits.

From the impact evaluation study (Baltussen et al, 2013) it appear that consumers indicate to attach importance to a country of origin label, but are not willing to pay for this. This might be due to them seeing such a label as being part of the right to information and thus not 'eligible' for payment. For that reason the remainder of this section focuses on the cost impact of labeling, ignoring the consumer side.

4. Impacts of MCOOL scenario's on costs of production in EU meat sector

As argued before, whereas standards or certificates might increase benefits (e.g. environmental, sustainable production, animal welfare, product quality etc.), they usually will have implications on costs of production (e.g. $\partial w / \partial R \geq 0$). As relative cost impacts might differ over member states (and scenario's) also competitiveness and trade flows might be affected (see previous discussion of impacts).
In order to assess the impact on the cost of production at member state level an analysis has been made about the national/regional and supply chain peculiarities. Indicators that were considered as potentially important to play a role in explaining the costs impacts and differences over different Member States were:

Supply chain indicators

- Chain length of live animals (number of movements between stages)
- Chain length of meat chain (number of movements between meat businesses)
- Number of international movements
- Scale of businesses (small, medium, large)
- Traceability systems in place
- Separation of supply chains for origins
- Amount of meat sold unprocessed
- Amount of unprocessed meat sold pre-packed.
- Market differentiation (high value products versus commodity)
- Voluntary labelling in place

Trade indicators

- Self-sufficiency in meat
- Import/export of live animals and meat products

To operationalize the cost impacts of labeling, based on a number of case studies, estimates have been made of the potential cost impacts for firms that are seriously affected and other cases. Based on this information a classification has been made in 4 impact categories: 1) no additional costs, 0%; 2) low, 1%; 3) medium, 3%; 4) high impact, 5%. Using the supply chain and trade characteristics listed above, an estimate has been made about the market shares $s_{i,j,h}$ (impact category *i* ($i = 1, ..., 4$); meat type *j* (*j*=pork, poultry), and member state *h*) associated with these impact classes. The cost increase impact at the member state *h* for meat type *j* can then be written as:

$$dw_{j,h} = \sum_{i}^{4} s_{i,j,h} \; ic_{i,j} \qquad (6)$$

with $ic_{i,j}$ representing cost impact associated with impact category *i* and meat *j*, and $dw_{j,h}$ measured in terms of a costs increase in euro per ton of meat at wholesale level.

The estimated cost impact results are presented in Figure 1, which provide the cost estimates for both scenario's, for the key countries and for pork (left side) and poultry meats (right side). For pork the cost increase varies from €22/t to €64/t (EU-27average €43/t) and for poultry from €6/t

to €73/t (EU-27 average €26/t), with the variation reflecting differences in national supply chain characteristics.

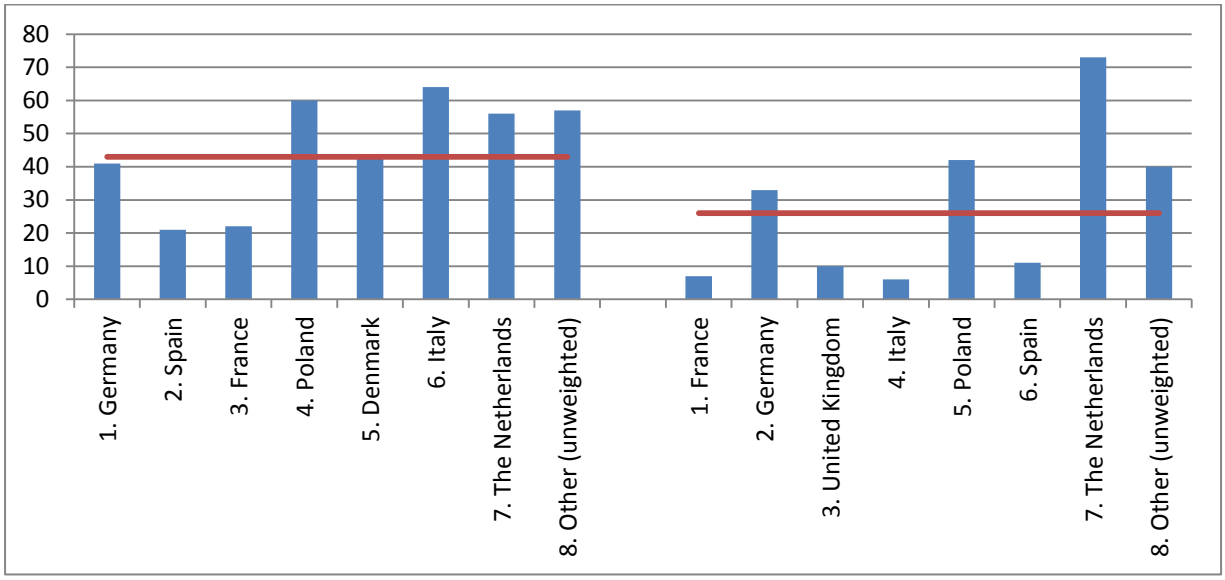

Figure 1 Estimated cost impacts of mandatory origin labeling for pork (left panel) and poultry (right panel) for selected member states (euro/ton; EU-27 average is straight line)

Note that the numbers in Figure 1 are averages at member state level. For individual firms the expected cost increase cost can be far higher (above 10% additional costs of the wholesale price). The costs turned out to be in particular dependent on firm size (highest cost increase for medium sized companies), the method of sourcing animals or meat (more than proportional cost increase as the number of origin sources rises), the traceability system in place (lower costs if good traceability system exists), the presence of voluntary labelling systems (lower costs if a voluntary origin labelling system exists), the IT systems in place (a large part of additional costs is related to necessary changes of IT systems), and the degree of integrated production (if the production chain is more integrated the additional costs for origin labelling will decrease) (Baltussen et al, 2013, 78). Since there are significant differences over firms, introducing origin labeling not only affects the competitive position of member states (changes in relative costs of production), but will also intensify internal competition between firms within member states.

5. Explorative empirical assessment on trade impacts

For the simulation of origin labeling scenario's the CAPRI-model is used. This model has as an advantage its detailed representation of the EU member states and their meat markets. A drawback is that only has a net trade representation of EU-intra trade and as such ignores or underestimates the potential impact of product heterogeneity[5]. The model, which is widely used for EU policy impact analyses, has its focus on primary agriculture, and includes other (downstream) parts of the supply chain (such as slaughtering, further processing, retail) often in

[5] For further details on the modeling tool see the CAPRI website http://www.capri-model.org/dokuwiki/doku.php?id=start

a comprised way. The downstream stages are taken into account using the so-called margin approach. See Figure 2 for a graphical illustration, where S_{prods} denotes the supply curve of "meat" supplied by the primary sector (e.g. live weight pig meat) and S_{cons} denotes supply of fresh pre-packed meat as it enters the retail market. D_{cons} denotes the demand for meats. The model assumes this margin to be a fixed mark-up. The margin comprises the contributions made to the primary meat product by the various downstream stages of the supply chain. Here these stages are decomposed into the part associated with the costs and value added made by the slaughter house (*SH*) and those associated with the other processing and handling stages (*OS*). The fixed mark-up approach implies that the final consumer product includes a fixed amount of primary sector meat (i.e. no substitution with added inputs from downstream processing).

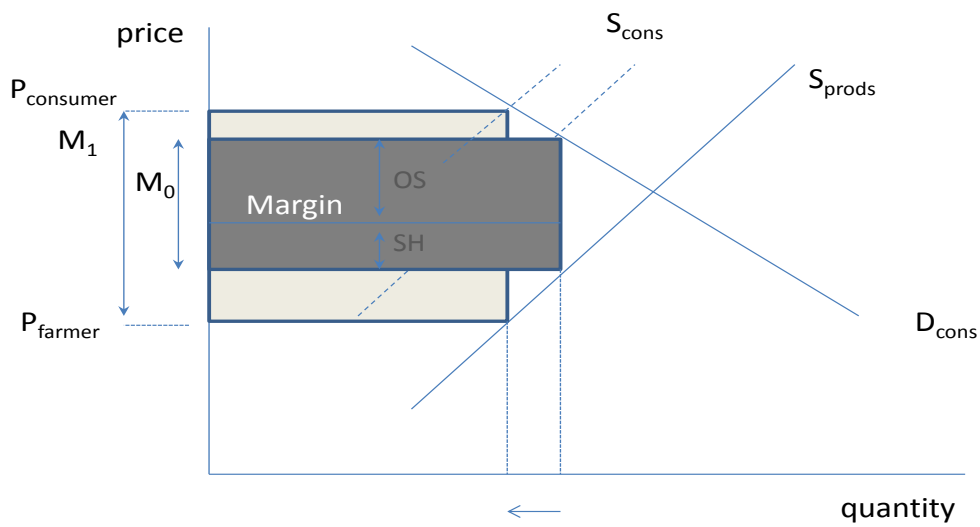

Figure 2 Fixed margin-approach to supply chain modeling

The cost shocks associated with origin labeling have been simulated by adjusting the margin (e.g. from M_0 to M_1). Whereas the margin in the CAPRI model comprises the inputs and value added by all downstream sectors, the cost shocks as they are calculated in this research are costs at the level of slaughter houses. For example, a found 3% cost increase, means that the costs of the slaughter house increase by 3% due to the requirements associated with origin labeling. Here "costs" refers to the costs of meat, including the price paid for the animals paid to farmers plus the additional costs associated with the transportation to the slaughtering house plus the costs of the slaughtering (i.e. $P_{farmer} + SH$). Note that this includes only a part of the total margin (i.e. $M_0 - OS$) of the downstream supply chain stages as they are shown in Figure 2. A proper transformation has been applied to "translate" the costs shocks as they have been calculated in this project at slaughterhouse level to the change in the total margin. The percentage change in the total margin M is a function of the calculated cost increase at the slaughter house level (*dw*) as follows (with subscripts being suppressed for convenience sake)

$$\%M = \frac{\Delta M}{M}.100\% = \frac{(P_{farmer} + SH + dw)}{M}.100\% \qquad (7)$$

Table 1 Impacts of origin labeling on pork and poultry meat net trade flows for selected member states and EU-27.

Pork			Poultry		
member state	1000t		member state	1000t	
1. Germany	5	1.60%	1. France	-1	-0.70%
2. Spain	-2	-0.40%	2. Germany	2	-10.30%
3. France	-1	-1.70%	3. United Kingdom	0	0.10%
4. Poland	10	-8.90%	4. Italy	-1	8.00%
5. Denmark	-4	-0.30%	5. Poland	2	0.40%
6. Italy	6	-0.90%	6. Spain	0	0.50%
7. Netherlands	-1	-0.10%	7. Netherlands	2	0.60%
Other MS	23	-4.47%	Other MS	2	3.92%
EU27	36	2.00%	**EU-27**	6	0.80%

Source: Baltussen et al (2013)

The calculated trade impacts are presented in Table 1. As Table 1 shows, the impacts on the net trade position of Member States are in most cases relatively limited, with the induced changes in the net trade in general being less than 2000 tons and/or less than 2 per cent up or down from the reference level. In the case of pork France's net trade worsens by about 1.7%, whilst Germany improves by the same percentage. Poland's pork trade improves as net imports decline by almost 9%. Despite being a big producer Poland is still a net importer. The decline in its net imports implies that the local pig sector strengthens its position in the domestic market. The pattern observed for Poland also holds for other eastern European Member States with similar characteristics. Note that for pork as well as of poultry at EU27 level the net exports increase (by 2.0 and 0.8% respectively). This is the result of a decline in domestic demand (as a response of consumers to the higher meat prices), and a less pronounced decline in domestic production. As a result of this the exportable surplus increases, increasing EU net exports to the rest of the world.

From the modelling analysis (see further details in Baltussen, 2013, 72-74) it turns out that producer and consumer prices are affected differently. The average changes in pig meat producer and consumer prices in the EU27 are about -0.4% and +0.9% respectively. From this it can be deduced that on average in the EU27 about 12% of the extra costs for labelling are transmitted to the producers, while about 88% of the extra costs are transmitted to the consumer. For example, the 0.4 % lower producer prices equals a price decrease of about 0.6 eurocents (0.4% of €1.60/kg) while the 0.9% increase in consumer price represents an amount of about 5.4 eurocents (0.9% of €6/kg). This differs per Member State (Baltussen et al, 2013, 72). The average changes in poultry meat producer and consumer prices in the EU27 due to the labeling equals about -0.1% and +0.4% respectively. Assuming producer and consumer prices of €1.75/kg and €5.40/kg respectively this implies that producers receive 0.2 eurocent per kg less (0.1% of €1.75), whereas consumers pay an additional 2.2 eurocents per kg (0.4% of €5.40).

6. Concluding remarks

According to the methodological framework developed in a competitive market environment labeling will lead to an increase in costs for meat products. In case consumers do not value the origin label, i.e. express a zero willingness to pay, origin labeling will lead to a unambiguous welfare loss. In general the overall impacts of mandatory origin labelling of pre-packed unprocessed pork and poultry meat on costs of production and net trade flows turned out to be limited, with pig meat being more affected than poultry meat. Nevertheless the different cost impacts that were observed indicate that there are impacts on the competitive position of member states and there is also evidence that origin labeling will intensify competition between differently affected individual firms within member states. Consumers – who face in relative terms the greatest monetary impact – need to have sufficient non-monetary benefits (varying from 2 to 5 eurocents per kg of pork or poultry meat) from the additional information to be better off. Also primary producers have to pay part of the burden of the costs associated with the mandatory labeling of origin.

Some qualifying statements have to be made with respect to the trade impact simulations. Firstly, the assumption of full competition inherent in the CAPRI model, although thought to be a reasonable one, has not been empirically tested. As such it cannot be excluded that imperfect competition may exists at different places along the supply chain. If this is the case, the distribution of the impacts over different actors might change (for example a larger part of the burden might be passed on to primary agriculture). Second, the CAPRI model provides only a net trade representation of EU intra trade. As such it is not possible to explicitly allow for the heterogeneity of meat products over EU Member States. In reality quality differences exist, which might reduce the degree of substitution. Third, it has been observed that countries which are important exporters of fresh meat of pigs and poultry are at the same time important importers, such as for example the Netherlands. This is likely to be mainly driven by specific commercial interests that go beyond pure origin considerations (e.g. there may be a surpluses of some cuts of meat, which are exported and shortages of other cuts, which are imported or big retailers want to have at least two big suppliers of fresh meat which cannot be found in their own country). The relatively small changes in relative costs are not likely to overrule these concerns and generate strong realignments in bilateral imports and exports due to cost-arbitrage. In general these qualifications imply that bilateral trade between Member States may adjust to a lesser extent than is now implied by the CAPRI model outcomes (assuming consumer preferences will remain unchanged).

References

Baltussen, W., Jongeneel, R., Helming, J., Dewar, D., Van Horne, P. a.o. (2013) Study on mandatory origin labelling for pig, poultry and sheep & goat meat AGRI-2012-EVAL-01. Brussels, European Commission, http://ec.europa.eu/agriculture/external-studies/2013/origin-labelling/fulltext_en.pdf .

Brester, G.W., Marsh, J.M., Atwood, J.A. (2004) Distributional Impacts of Country-of-Origin Labeling in the U.S. Meat Industry. *Journal of Agricultural and Resource Economics* 29(2): 206-227.

Dinopoulos, E., Livanis, G., West, C. (2010) Country of origin labeling (C.O.O.L): How cool is it? *International Review of Economics and Finance*, 19: 575-589.

Disdier A-C. and S. Marette (2012) Globalisation issues and consumers' purchase decisions for food products: evidence from a laboratory experiment. *European Review of Agricultural Economics*, 40(1): 23-44.

FSA (2010). Country of Origin Labelling: A Synthesis of Research. Oxford Evidentia. Social Science Research Unit Food Standards Agency, January 2010.

Ehmke M. T., Lusk, J. I. and W. Tyner (2006) "The Relative Importance of Preferences for Country-of-origin in China, France, Niger and the United States", Contributed paper presented at the IAAE Conference, Gold Coast, Australia, August 12-18, 2006.

Haaster-de Winter, M.A van, and Ruissen A. (2012). Voedsel labelen met land van herkomst: leuk, maar geen voorwaarde; Onderzoek onder Nederlandse consumeren. LEI report 2012-021. The Hague: LEI. Translated: Food labelling by country of origin, nice, but no requirement. Research of Dutch consumers.

Herzfled, T. and Jongeneel, R. (2012) Why do farmers behave as they do? Understanding compliance with rural, agricultural, and food attribute standards. *Land Use Policy*, 29(1): 250-260.

Brester, G. W., Marsh, J. M. and J. A. Atwood (2004): Distributional Impacts of Country of Origin Labelling in the US Meat Industry. *Journal of Agricultural and Resource Economics* 29(2):206-227.

Krissoff, B., Kuchler, F., Nelson, K., Perry, J., and Somwaru, A. (2004) "Country of Origin Labelling: Theory and Observation", ERS working paper, WRS-04-02, ERS, Washington DC.

Larson, B.A. (2000) Evaluating the Impact of Specific Environmental Regulations on Exports. *Land Economics*, 76(4): 534-549.

Lust J. I. and J. D. Anderson (2004) "Effects of Country of Origin Labelling on Meat Producers and Consumers", *Journal of Agricultural and Resource Economics*, Vol.29(2):185-205.

Matsumoto S. (2011) Impact of Country-of-Origin Labelling on Bovine Meat Trade. *Journal of Agricultural and Food Industrial Organization*. 9(1): 1542-0485.

SANCO (2012) Consumer Market Study on the Functioning of the meat market for consumers in the European Union. SANCO/2009/B1/010, prepared by GfK EU3C, LEI WageningenUR, Capgemini Consulting.

Terluin, I., Benninga, J, Berkhout, P., Immink, V., Janssens, B., Jongeneel, R., Rau, M.L., Tacken, G. (2012) Origin labelling; Cost analysis for producers and consumers. The Hague, LEI-Wageningen-UR, Report 2012-067b