Katholieke Universiteit Leuven
Faculty of Applied Bioscience and Engineering

Working Paper
2004 / 91

CONSUMER WILLINGNESS TO PAY FOR DOMESTIC MILK

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October 2004

This paper (pdf) can be downloaded following the link:
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Vandemersch, M. and E. Mathijs. "Consumer willingness to pay for domestic milk." Working Paper, n° 91, Centre for Agricultural and Food Economics, Katholieke Universiteit Leuven, 2004.

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Abstract

Dairy farmers' profit margins are under pressure due to the downward trend of EU commodity prices for fluid milk and the increasingly powerful retail sector, in combination with increasing production costs. A likely solution to counter small margins is to add value to raw milk. This paper investigates the option of using a domestic origin-certification to upgrade the value of milk. Data stem from a consumer survey, conducted at the three largest supermarket chains in Flanders (Belgium). The results show evidence for a latent demand for domestic milk. Based on actually purchased brands in combination with top-of-mind attributes, two consumer types were distinguished (*price-shoppers* and *added-value seekers*), each with a different behaviour concerning domestic milk. Socio-demographic, attitudinal and behavioural variables were found to influence the probability that a consumer is willing to pay a premium for domestic origin-certified milk. But, the influence of these variables differed between both consumer types as well as when a different bid level was proposed.

Introduction

EU commodity prices for fluid milk show a continuing downward trend, while also its retail price is under pressure[1]. Combined with increasing production costs, this puts a heavy pressure on farmers' profit margins. After small, inefficient producers have already been forced out of business, the pressure to price at (short-term) marginal cost may even threaten the viability of efficient producers, as investments are undermined by the inability to recover costs (Dobson et al., 2003). Consequently, dairy farmers in Western Europe have become worried about their survival. In several countries, they have undertaken actions against too low prices in the supermarket. Since 2002,

Belgian farmers' organisations and dairy farmers check retail prices for fluid milk. When the price drops below the level of € 0.47[2] per litre, they undertake protest and consumer awareness actions at supermarket stores.[3] Similar actions against a fall of fluid milk prices in supermarkets (especially the hard discounters such as Aldi and Lidl) have taken place elsewhere in Europe (Germany, UK, Ireland, The Netherlands). In some countries (France, Germany) farmers also survey the dairy processing companies, in order to prevent them from closing sales contracts with the retail for ever-lowering prices.

Mainly three factors determine the decreasing margins for dairy farmers. First, production costs are increasing. This is due to increasing land and labour prices, rising costs of inputs such as fodder, seed, pesticides, veterinary services, compliance costs with respect to quality and environmental regulations, the European quota system, etc. It must be noted that there are considerable differences between countries concerning the implementation of quota and food safety, quality and animal welfare regulations. Although minimum requirements are the same across the EU, each country can choose to pursue a stricter policy. Also, EU enlargement drives up competition with countries that face lower production costs.

A second factor is the downward trend in official EU dairy prices. Since the MacSharry reform (1992), the Common Agricultural Policy[4] of the EU is gradually decreasing price support for milk and partly replacing it by direct income measures[5]. Primary reason is the inconsistency of price support with world trade liberalisation. Total free trade emphasizes one milk price around the world, resulting from the interplay between demand and supply[6]. Data about the decrease of the target price for

milk are given in table 1. It is questionable whether EU dairy farmers, who have been stuck in a regulated market system, can now make the switch to compete at world prices.

Finally, increasing retail concentration and retail power increase the pressure on primary producers. The concentration in retail and the occurrence of hard discounters such as Aldi and Lidl (expansion of the cheap market) have lead to strong competition between retail groups. Most obvious is the example of The Netherlands, where supermarkets compete each other's (milk) prices in a price war. This creates a high pressure on the prices retailers are willing to pay to producers. Furthermore, the tendency towards large chain-store retailers, who control significant shares of national markets, gives these the possibility to exercise substantial buyer power over their suppliers (Competition Commission, 2000). The steady increase of the market share of retail brands implies even additional market power for large retail groups and thus additional pressure on producers' prices. Thus, retail's scale of operation and their control of purchases means that they are able to effectively dictate terms and conditions to farmers. They can drive down the prices and margins that farmers receive through aggressive bargaining strategies (Dobson et al., 2003).[7]

A likely solution to counter small margins for the dairy producers is to add value to raw milk[8]. One way to do so is by processing it to cheese, milk drinks, etc[9]. Another way is by adding features to liquid milk. An example is selling milk that satisfies stricter quality demands than standard milk does (extra quality milk)[10]. Other possibilities originate from the rising importance of healthy foods, creating new opportunities to add value to milk. Examples are milk added with calcium and vitamin

D, that helps the uptake of calcium, and milk enriched with sterol that has a cholesterol lowering capacity. Furthermore, following consumers' search for enjoyment in food, milk with special flavours (like chocolate, vanilla) has entered the market. Major drawbacks with these types of 'specialty' milk are the high costs for research and development and the high costs for marketing. For example, the marketing costs for sustaining an A-brand are estimated at € 5 million a year on average[11]. National milk processing companies do not have a sufficient scale and capacity to carry these costs. Moreover, the market for such 'specialty' products seems to be small, while consumers' willingness to pay might be too low to cover all costs.

Little emphasis has been placed on the option of using an origin indication to upgrade the value of milk. Nevertheless, this option has some important advantages. The origin indication as such implies no particular research costs. Further, it can appeal to consumers for (a combination of) different reasons. First, the country of origin may have an influence on the product characteristics itself (e.g., freshness, nutritional value, safety, quality, taste, environmental impact). Second, the image of the country of origin (COO) may affect the perception of the product's attributes: products from countries with a better image (e.g., more developed compared to less developed countries (e.g., Alfnes, 2004)) and products from the home country or from countries with a similar culture as the home country are perceived to be better. Third, COO may appeal to the consumer's emotions towards his/her home country. This phenomenon, called consumer ethnocentrism (Shimp & Sharma, 1987), advocates consumers to prefer domestic to imported food products, out of loyalty with domestic agriculture or out of a feeling of duty to support it. Fourth, some environmental and ethical

arguments may administer the COO effect, especially for local products. It concerns for instance the food miles of local compared to imported products. Such arguments are likely to affect only a small segment of the consumers.

The objective of this paper is to investigate the opportunity to add value to consumption milk in a domestic milk market, based on its origin. Two research questions are covered: (1) what is the willingness to pay of consumers for domestic origin-certified milk, and (2) what socio-demographic, attitudinal and behavioural variables determine this willingness to pay? These research questions are investigated in Flanders (Belgium). The paper is structured as follows. First, we present an overview of studies about willingness to pay for local or domestic origin in food. Next, the data collection and methodology used in this paper are outlined. Then, a discussion of the results is followed by the conclusions.

Local origin and willingness to pay

Empirical studies about consumers' preferences for local or domestic compared to imported (food) products are numerous. Those studies that have tried to value these preferences by investigating consumers' willingness to pay (WTP) all measured to some extent an average WTP for the local or domestic origin of food. For example, a mail survey by Brown (2003) among UK respondents revealed that respectively 16%, 5% and 1% of the respondents stated to be willing to pay 5%, 10% and 25% more for a locally grown product compared to an unlabeled product of the same quality. Six percent of the food buyers claimed they would pay 'any price' for locally produced versus non-local food. Earlier studies by Brooker et al. (1987) and Bruhn et al. (1992) in the US found that WTP more for local food products depended on the product (type

of fruit or vegetable), with more consumers willing to pay more for local tomatoes compared to apples, broccoli, cabbage, peaches, corns or greens[12]. According to consumer surveys conducted in Colorado grocery stores, locally grown potatoes carry a potential premium of about 5% over the initial price (Loureiro & Hine, 2001), while consumers are on average willing to pay large premiums to obtain "Certain US beef" (Loureiro & Umberger, 2003). Other studies concerning meat products came to similar findings. Quagrainie et al. (1998) found that the price of a non-Alberta meat product had to be reduced by 15 percent compared to a similar product produced elsewhere in Canada so that consumers would be indifferent between the two sources. A majority of Chicago and Denver consumers were willing to pay average premiums of about 20% for the US labelled steak (Umberger et al., 2003). Loureiro & McCluskey (2000), using a hedonic approach, showed that Spanish consumers were willing to apply a premium for local (Galician) meat. Alfnes (2004) measured average WTP values for imported hormone-free beef compared to domestic (Norwegian) beef ranging from 34 NOK up to 110 NOK (for a neighbouring country up to a developing country respectively).

In addition to just determining an average level of WTP, consumer-based WTP studies typically attempt to determine individual characteristics that differentiate those consumers who are willing to pay a certain premium from other consumers. The focus is usually on traditional socio-demographic variables such as age, income, education, etc. These variables often serve as proxies for tastes and preferences, assuming that the latter are similar for individuals who belong to the same socio-demographic group (Harris et al., 2000). However, tastes and preferences can vary widely within demographic groups (Baker & Crosbie, 1993). Therefore, a good model requires that

in addition to the traditionally important demographic variables also other types of variables such as attitudinal variables (Harris et al., 2000) and behavioural variables (Baker & Crosbie, 1993) are included.

Most of the previously mentioned WTP studies took account of attitudinal variables. In doing so, they revealed that COO was especially an issue when consumers associated it with background reasons such as food safety, nutritional value, quality and traceability. Loureiro & Hine (2001) found that consumer concerns about nutrition was the only variable that significantly (positively) affected WTP for "Colorado-Grown" potatoes, indicating that home grown must be linked to quality to garner the higher premium. In Loureiro & McCluskey (2000), WTP was also dependent on quality. In Loureiro & Umberger (2003), one of the primary driving forces for WTP was a high food safety perception associated with US beef rather than geographical origin in itself. Loureiro & Umberger (2004) attributed the fairly low WTP they found for a non-further specified designation of origin in rib eye steak to the fact that COO labelling was simply presented as 'a' designation of origin, without carrying any particular connotation or reputation for a certain quality. Verbeke & Ward (2003) confirmed this finding for Belgium. Belgian participants expressed more interest in labelling cues denoting quality and quality standards of meat than in labelling cues related to traceability and origin. Hence, they recommended to use traceability as a means to "back-up" quality labelling cues.

Data collection

To investigate the willingness to pay of consumers for origin certified milk and its determinants, we carried out a survey among consumers in the three largest

supermarket chains (Carrefour, Colruyt and Delhaize) across Flanders.13 The use of an actual consumer sample benefits the trustworthiness of the research results. Furthermore, by collecting data from consumers at the same time and place where actual purchase decisions are made, data were obtained directly from the actual decision-makers and thus should better elicit consumers' true preferences (Loureiro & Umberger, 2003).

Interviews were taken face-to-face using a standardised questionnaire (see annex 1). Since data had to serve a broader purpose than just this paper, the questionnaire emphasized nine products (jam, mayonnaise, milk, chocolate, yoghurt, apples, carrots, tomatoes and potatoes). The design of the survey instrument aimed at minimising the complexity of questions and the amount of time necessary to carry out the interview. For each of the nine products a consumer had bought, the purchased brand/cultivar was written down. Next, the consumer was asked why he/she had chosen that particular brand/cultivar, revealing the most important top-of-mind reasons only. Two concluding questions for each product concerned its perceived origin and the loyalty to the brand/cultivar chosen. Socio-demographic characteristics were asked for as well as some issues concerning shopping behaviour. Additional attitudinal information was obtained by the use of statements that the consumers had to score on a 5 point Likert scale ranging from total disagreement to total agreement. More details about the variables are described in the model specification. Finally, the consumers were asked about their willingness to pay a premium (5 or 10 eurocent per litre) for Belgian-origin certified milk in a yes/no question.

Data were collected at the end of November 2003 by 18 students, after a common briefing in which they were given the necessary instructions orally as well as written out. Questionnaires were taken at the exit of the supermarket right after the purchases took place, an approach that is supposed to favour the reliability of the answers. In soliciting the consumers' involvement, it was explained that the interview would take approximately 10 minutes to complete and concerned their choices and buying behaviour. No reference to origin was made. Each student performed two sessions, each session involving approximately 18 consumers. In total, 626 questionnaires were collected. Sampling was done randomly with quota for three age groups. However, people in the oldest age category (older than 55) were less willing to participate (perhaps because of some distrust against the interviewers). Of the nine selected products, this paper only considers milk, which was bought by 51% of the respondents.

Methodology

We used a dichotomous choice question to investigate if consumers were willing to pay more for domestic origin-certified fluid milk. Actual purchases cannot detect the separate effect of origin since origin indication was only present on extra quality milk. This is one of the reasons why we used a stated preference method to measure WTP. In addition, stated preferences are less expensive and easier to obtain14. The question asked to the respondents was: "Are you prepared to pay c eurocent more for a bottle/box of milk, if you are assured that it is Belgian milk that you buy?" The price asked for was varied across surveys: half of the consumers were proposed an amount of 5 eurocent, while the other half were proposed an amount of 10 eurocent. We used

this simple method because it is the least complicated to consumers and the time available to interview them was limited (see also earlier).

Theoretically, WTP measures the maximum[15] amount of money an individual is willing to give up to either: (a) obtain a product with quality q or (b) exchange a product with quality q_0 for a product with quality q_1 (Lusk & Hudson, 2004). The consumer's decision process is modelled using a random utility approach. Consumer utility, $U(y, x, m)$, is assumed to have three arguments: whether the milk has a Belgian-origin certification, y, other product attributes and consumer characteristics that may affect consumer choice, x, and the income level, m (Loureiro & Umberger, 2003). The variable y is an indicator variable, which equals one if the product is Belgian origin-certified, and zero otherwise. The consumer is willing to pay c eurocent for a litre of Belgian origin-certified milk above the amount of a generic litre if his/her utility of this option is at least as great as that of the option without origin-certification. Mathematically, c is represented as

$$(1) \qquad U(0, x_0, m) \leq U(1, x_1, m\text{-}c)$$

where the 0 and 1 subscripts denote the choice of non origin-certified and origin-certified products, respectively. Because some components of the utility function are unknown to the researcher, utility is decomposed into an observable part and an error term, ε_j. Mathematically, $U(y, x_j, m) = V(y, x_j, m) + \varepsilon_j$. The random error term ε_j is assumed to be independently and identically distributed with a mean of zero. Thus, the consumer's decision to pay c eurocent in terms of utility can be represented as:

(2) $V(0, x_0, m) + \varepsilon_0 \leq V(1, x_1, m\text{-}c) + \varepsilon_1$

The decision to pay *c* is then expressed in a probability framework as

(3) $\Pr(\text{WTP} \geq c) = \Pr(V_0 + \varepsilon_0 \leq V_1 + \varepsilon_1) = \Pr(\varepsilon_0 - \varepsilon_1 \leq V_1 - V_0)$

The random utility approach sets the base for the empirical models that follow. In this paper, independent logistic regression was chosen to analyse a consumer's decision of paying for domestic origin-certified milk. Logistic regression is a common method for the estimation of binary dependent variables such as the probability of WTP (Hanemann, 1984; Govindasamy et al., 2001). In the independent logit models, P_i represents the probability that the i^{th} consumer will make a certain choice (answer = "yes"). X_i is a vector of observed socio-demographic, attitudinal and behavioural variables and β is a vector with the corresponding estimated variables' coefficients. The error vector ε_i consist of unobservable random variables that follow a logistic distribution. The resulting logistic probability function, describing P_i is:

(4) $$P_i = F(WTP_i) = \frac{1}{1+e^{-WTP_i}} = \frac{1}{1+e^{-(X_i b + e_i)}} \qquad i = 1, \ldots, n$$

The probability that the i^{th} consumer will answer "no" to the question regarding WTP for origin-certification is then represented by $1- P_i$, with

(5) $$1 - P_i = \frac{1}{1+e^{WTP_i}}$$

The odds ratio in favour of saying “yes”, versus saying “no” is calculated as the ratio of both probabilities.

$$(6) \qquad \frac{P_i}{1-P_i} = \frac{1+e^{WTP_i}}{1+e^{-WTP_i}} = e^{WTP_i} = e^{X_i b + e_i}$$

By taking the natural log of (6), the odds ratio in favour of answering “yes” becomes a linear function of $\mathbf{X}_i$. This can be shown as:

$$(7) \qquad Log\left(\frac{P_i}{1-P_i}\right) = WTP_i = X_i b + e_i$$

The maximum likelihood (ML) estimation was applied, as it is the general model of estimation to predict a dichotomous dependent variable based on explanatory variables. ML estimation yields values for the unknown parameters by maximising the probability of obtaining the observed set of data (Hosmer & Lemeshow, 1989).

Model specification

The empirical model measures the probability that a consumer is willing to pay a premium for Belgian origin-certified milk. The likelihood of observing the dependent variable was tested as a function of three main categories of independent variables: socio-demographic, attitudinal and behavioural variables. Summary statistics of these variables are presented in table 2. Furthermore, province dummies and a bid variable were included in the model. The initial specification of the WTP equation for Belgian-origin certified milk was as follows:

(8) $WTP = b_1 + b_2 Bid + b_3 Oost\text{-}Vlaanderen + b_4 Antwerpen + b_5 Vlaams\text{-}Brabant + b_6 Limburg + b_7 Age + b_8 Education + b_9 Off\text{-}profession + b_{10} Self\text{-}employed + b_{11} Employee + b_{12} Other\ profession + b_{13} Connect\ Agro/Food + b_{14} Female + b_{15} Male\&Female + b_{16} Income + b_{17} Price + b_{18} Quality + b_{19} Taste + b_{20} Habit + b_{21} Price/Quality + b_{22} Package + b_{23} Brand\ Loyalty + b_{24} Influenced + b_{25} Local + b_{26} Time + b_{27} Haste + b_{28} Frequency + \varepsilon$

In the above specification, *Bid* represents a dummy variable for the amount that each respondent was asked to pay extra for a litre of Belgian origin-certified milk. A value of 0 means that he/she was asked about the amount of 5 eurocent, a value of 1 means that he/she was proposed the amount of 10 eurocent. Five *Province* dummies were included, corresponding to the five provinces in the Flemish part of Belgium (West-Vlaanderen is the reference).

Socio-demographic variables include age, education, professional status, connectedness with the agricultural and/or food sector, gender and income. The *Age* and *Education* variables are categorical, ranging from the category younger than 35 (*Age* = 1) up to the category older than 55 (*Age* = 3) and from having a primary grade (*Education* = 1) up to having a university degree (*Education* = 4) respectively. We included five *Professional Status* dummies: off-profession[16], self-employed, employee, other profession and labourer (reference). The dummy variable *Connect Agro/Food* identifies consumers who are connected with the agricultural or food sector through their job or family (1 = connected, 0 otherwise). The *Gender* dummies distinguish between women shopping together with children or together with other women (Female), men alone or in the company of other men or children (Male) and

men accompanied by women (Male&Female). Male formed the basis against which the other two dummy variables were valued. *Income* represents the number of income sources in the household[17].

The attitudinal variables were subdivided into product-specific and general ones. The *product-specific* variables *Price*, *Quality*, *Taste*, *Habit*, *Price/Quality* and *Package* are representing the attribute(s) that had primarily determined the actual milk purchase of the respondent (top-of-mind reasons), i.e. the subjective consumer preferences when buying milk. The variables score 1 if the respondent had spontaneously named that attribute in answering why he/she had chosen a particular milk brand, 0 otherwise. It can be assumed that these attribute variables reflect important information about a respondent's price sensitivity, quality consciousness, love of ease, … *Brand loyalty* had a score of 1 if the respondent said to always buy the same brand of milk and 0 otherwise. Two indices made up the attitudinal variables of a more *general* nature. Both *Local* and *Influenced* were created on the basis of responses to attitudinal statements (on a 5-point Likert scale). *Local* averages out 5 statements about a person's attitude related to various reasons for buying local: (1) We all should buy as much as possible products that are produced in Flanders; (2) Persons who buy home-grown food products directly support the Flemish agricultural and food sector; (3) I think it is important that my supermarket buys by preference Flemish products, even if these are more expensive; (4) I have good trust that imported food products have the same quality as those from my own country; (5) To me, it does NOT matter if a food product is home-grown or imported. *Influenced* is a combination of 2 statements about how easy or difficult the consumer is influenced by family, friends and advertising:

(1) I mostly choose products that have been advertised; (2) I mostly choose the same products as my family/friends do.

The behavioural variables refer to shopping time and shopping time constraints. The variable *Time* was valued 0 when the respondent was interviewed on a weekday and 1 when the shopping moment and interview took place during the weekend. *Haste* was a (1-5) scale measure of the respondent's haste when shopping. The weekly *Frequency* of a respondent's supermarket visits is indicated with 0 for less than once a week, 1 for once a week and 2 for more than once a week.

Results

The percentage of yes responses to the question 'whether one is prepared to pay *c* eurocent more for a bottle/box of milk, if one is assured that it is Belgian (or Flemish) milk one buys is given in table 3. A surprisingly large number of people answered positive to the question posed, 51.1% and 52.6% for *c* being 5 and 10 eurocent respectively. Although still high (respectively 47.5% and 51.9%), these percentages are slightly less when only looking at the milk consumers. It is likely that our data suffer from overestimation. However, this does not mean that the information provided is invalid. Even if the percentage of people who are really willing to pay the stated bid for Belgian origin-certified milk is lower – as in reality budget constraints come into play – the results indicate that origin is an important feature for people when buying milk. At least, our results suggest that there is a market penetration potential for origin-certified milk[18]. Before turning to the logistic regressions, we take a closer look at milk purchasing behaviour by brand categories.

Consumer types and brand categories

The respondents who had bought milk were asked to spontaneously indicate what had determined their choice for a particular brand. The attributes that turned out to be of primary importance were, in descending order of importance: price (30.5%), taste (22.1%), habit (17.8%), good value for money (price/quality) (9.7%), quality (7.8%) and form of package (6.9%). Other attributes and thus also origin, were named spontaneously by less than 5% of the milk purchasers. This confirms other studies where origin was found not to be an attribute of primary importance to consumers.

Complementary to the attributes indicated by people as important, data were collected about the milk brands purchased. A distinction was made between economic (E) brands, private label (PL) brands, manufacturer (M) brands and extra quality manufacturer (XM) brands. Out of 321 milk purchases, 281 could be classified under one of these brands. Almost half of the milk purchasers had bought a PL brand. M brands were chosen by 19.0% of them, while another 12.1% favoured the XM brand. Nearly 8% of the milk purchasers in our sample bought an E brand. Types of 'specialty' milk such as organically produced milk, soymilk and milk with added vitamins were chosen less frequently, indicating that such products are indeed directed to small (niche) market segments.

In table 4 the share of different brands in the total milk volume purchased as derived from GfK panel data is given[19]. The GfK classification is based on three categories: Distribution Owned Brands, Belgian Brands and Other. Belgian Brands comprise what we named the M and XM brands. Distribution Owned Brands more or less accord with the E and PL brands in our study, supplemented with the organic brands.

Comparing our data with those from GfK reveals only a partial correspondence. The number of PL brands and E brands bought by our respondents is an underestimation compared to the GfK panel data. This is probably due to the fact that our sample did not contain people shopping in hard discount stores. With price being an important criterion for the choice of the place of purchase, people shopping in hard discount stores are likely to be more price-conscious than the average consumers within our sample and thus add substantially to the market share of (especially) E brands. We must also note that our data do not take into account the purchased volumes, but only the number of consumers purchasing a particular brand, and that the GfK sample includes chocolate milk and other milk drinks while we only considered fluid, white consumption milk.

In order to gain a better insight into our sample of milk purchasers and into the relevance of the top-of-mind attributes they named for their purchase behaviour, we tested if these attributes differed when people bought a different brand of milk. A MANOVA analysis was carried out to test for overall group effects between the four major brands. The MANOVA effect was significant at the 1 % level (P=0.0082). Subsequent contrast testing revealed what brands were involved in the occurrence of significant differences. Results are summarised in table 5. Two main types of milk purchasers can be distinguished based on the attributes *Price*, *Taste*, *Price/Quality* (and to some extent also *Habit*) in combination with the brands actually chosen. One type are those who bought an E or a PL brand. Here, the number of price conscious people is fairly large (nearly half of them), as well as the number of people who emphasize good value for money (17.1%). Furthermore, taste is not a primary issue for the large majority of the people in this group (only 8.8% named it). The second

type groups the people who bought an M brand of normal or extra quality. Although some differences between normal and extra quality seekers occurred concerning price and taste, these were not statistically significant. Overall, taste is an attribute of primary importance for a large number of people in this type (42.0%). Contrary to type one, price and price/quality did appeal to only 8.0% and 0.0% of the people respectively. Table 5 reports on the WTP for domestic origin-certified milk per brand category and for both consumer types.

The existence of two types can be seen as an indication of polarisation between consumers. One pole consists of consumers searching for cheap(er) products (*price shoppers*); consumers in search for additional value form the other pole (*added-value seekers*). Such a polarisation is however a very simplified view on reality, as consumers might behave in the one or the other way at different moments in time, or related to different products. For instance, the same consumer may pursue different attributes and behave in a different way when buying milk for the preparation of meals (price) compared to buying milk to drink (taste). Perhaps this complexity is the major reason why few socio-demographic characteristics are different between both types (see table 2)[20]. Both Gabriel and Lang (1995) and Szmigin (2003) – among others - warned that it is hard to divide consumers into the one or the other category or type as they do not have a one-dimensional profile.

In order to reveal what socio-demographic, attitudinal and behavioural variables determine WTP for domestic-origin certification, we first performed a logistic regression analysis for the full sample. Then, separate analyses were done per bid level proposed to the consumers. In two final analyses, the sample was split up

according to the consumer types found based on the combination of actually purchased milk brands with top-of-mind attributes. The parameter estimates of the WTP equations are presented in table 6. The same table also shows that all five models fit the data reasonably well; the level of correct predictions is rather high.

Model for full sample

The initial specification for the full sample model is given by equation (8). In the process of selecting the final model, a number of insignificant variables (except *Bid*) were subsequently dropped if their *p*-value was larger than 0.4. No *Age* or *Gender* effect was found and also the index *Influenced*, the number of *Income* sources in the household and the *Frequency* of supermarket visits were not relevant in explaining WTP. The insignificant *Bid* dummy is inconsistent with what could be expected from demand theory, i.e. that the higher the bid amount requested to pay, the lower would be the percentage of affirmative responses to the WTP question (cf. Loureiro & Umberger, 2003).

The parameter estimates of all four regional dummies were positive; three of them (corresponding to Oost-Vlaanderen, Vlaams-Brabant and Limburg) were significant at the 1 or 10% level. It seems that in West-Vlaanderen, people are less likely to pay more for Belgian-origin certified milk than people in the other provinces. This seems surprising, as the dependency on agricultural production (used by Alfnes (2004) in explaining provincial differences) is highest in West-Vlaanderen[21]. Establishment of this effect would have caused the parameter estimates to carry negative signs. Probably the variable *Connect Agro/Food* accounted for the effect of dependence on

agricultural production, such that other elements of regional diversity determine the effects found.

The parameter estimate of *Education* was significantly negative, consistent with other COO literature that higher educated people are less susceptive for the COO effect, especially for its emotion-based aspects. The positive sign for the estimated parameters of the *Professional Status* dummies indicate that labourers were less likely to be willing to pay the proposed bids than the other categories. Professional status may give a better indication of the height of a household's income than the number of income sources (*Income*). The effect of self-employed, employee and other can then be ascribed to a higher income compared to the labourers.[22] People who are connected with the agricultural or food sector through their job or family are more likely to be willing to pay the proposed bid. This also corresponds to earlier findings, with stronger COO effects ascribed to people who themselves feel more directly threatened by imports.

Of the product-specific attitudinal variables originally included in the model, only the *Price* and the *Loyal* dummy were significant predictors. The sign of the parameter estimate of *Price* was negative, meaning that price sensitive people were less likely to be willing to pay a premium for Belgian-origin certified milk. This result is consistent with what was expected. Less people who stated to be *Loyal* towards the purchased brand of milk[23] were willing to pay the proposed bid. Satisfaction with their current brand as it is, might make them non-willing to pay more for an origin certification. The *Local* index had the expected positive sign. It is more likely for people who have

a more positive attitude towards buying local or domestic (food) products to have answered yes to the dichotomous question.

The parameter estimate of *Time* carries a positive sign. People interviewed while they went shopping during the weekend had a significantly higher probability for a yes answer than those who were interviewed during a weekday. People in the former group are more likely to belong to a double-income household. Conversely, the parameter estimate of *Haste* was negative, meaning that people with more haste when shopping, are less likely to be willing to pay more for Belgian origin-certified milk. This is inconsistent with the presumption that having more shopping time constraints (more haste) and thus a higher opportunity cost of (shopping) time is linked with a higher income and therefore also with a higher WTP (Jekanowski et al., 2000).

Models by bid group[24]

The elementary model revealed that differences in the bid level proposed – at least for the bid levels studied here – did not affect the probability of answering yes to the WTP question. However, it might be that yes responses come from people with different characteristics when the bid amount is higher or lower. To investigate this, a logistic regression analysis was performed for each bid level separately.

Parameters that remained significant in both models were *Price*, *Local* and *Time*. The regional dummy variables lost explanatory power in the 10-eurocent group, while people in the other provinces were more likely to pay 5 eurocent more for Belgian origin-certified milk compared to West-Vlaanderen. Other parameters that were concurrent with the full sample model only in the model of the 5-eurocent bid group

were *Education* (-) and *Connect Agro/Food* (+). In contrast, the effect of *Professional Status* only occurred in the highest bid equation. It seems that the lower income of labourers influences WTP only from a certain bid level onward. Three additional variables were also only significant in this higher bid model: *Female* (-), *Loyal* (-) and *Haste* (-).

Models by consumer type

Next to analysing the pooled sample of observations as a homogeneous group and for each bid level, the logistic regression model was applied to the consumer types one and two separately. As is shown in table 6, the relevance of several exploratory variables is different between both. Next to *Labourer*, also *Other* profession was left out in the second equation because people having an *Other* profession only appeared among the "no" answerers (quasi-complete separation in the sample points).

Noteworthy is that the parameter estimate of *Bid*, which was insignificant for the sample as a whole, got a negative sign when only type 1 people are considered. On the contrary, the sign remained positive for type 2 people and even became significant. An explanation for this can be that people within the second consumer type link a higher price premium with higher quality. Also *Loyal* got a different sign in both equations. People who stated to be loyal to the E or PL brand chosen (type 1) are significantly less likely to be willing to pay more for Belgian origin-certified milk. Brand loyalty of type 1 people might reflect price considerations. The parameter estimate of *Loyal* in the second equation was insignificant. Other variables for which the parameter estimates had opposite signs (*Female*, *Male&Female*, *Influenced*, *Income* and *Frequency* supermarket visits) were significant in none of both equations.

Other differences concerned the height of the parameter estimates. The effect of Antwerpen and Vlaams-Brabant (valued against West-Vlaanderen) is much larger for type 2 compared to type 1. The same is true for *Time*, with type 2 people more than type 1 people being likely to answer "yes" during the weekend compared to a weekday. The relevance of *Local* is higher for type 1 than for type 2 people, meaning that this attitudinal variable exercises a larger effect for the first consumer type. Due to the different base *Professional Status*, a comparison between both types concerning the effect of *Professional Status* on WTP is difficult. However, the height of the effect is much larger for type 2. *Haste* and *Education*, although negative in both models, are only significant in the first one.

The differences found between type 1 and type 2 in the effect of socio-demographic, attitudinal and behavioural variables on the dependent variable indicate that both groups should be considered separately when emphasising a successful business for Belgian origin-certified milk.

Conclusions

In this paper, a consumer survey was conducted to assess if domestic origin-certification can add value to milk. Our sample included consumers at the three largest supermarket chains in Flanders (Belgium). Although few people named origin as a top-of-mind attribute in milk purchase behaviour, the results do show evidence for a latent demand for domestic milk. Approximately half of the sample stated to be willing to pay a premium for domestic origin-certified milk, even though the proposed premiums were rather high (from 10 to 20 percent) proportional to the total milk price. The large number of yes responses can be explained by the fact that milk

involves only a small portion of total consumer budget. Besides, it is likely that some overestimation occurred due to the use of a dichotomous question format.

Factors that induced consumers to answer yes tot the stated question were, for the full sample, connectedness to agro/food (+), having mentioned price as a top-of-mind purchase attribute (-), loyalty to the brand purchased (+), score on the LOCAL index (+), shopping event during the weekend (+) and haste (-). Furthermore, the probability that a respondent is willing to pay more for Belgian origin-certified milk decreased with higher education level, for labourers compared to other professional status and for people residing in West-Vlaanderen compared to the other provinces. Bid was not statistically significant in the equation, as a similar number of people answered yes to both bid proposals. Nevertheless, the elements determining WTP differed when a different bid was proposed. One possible reason is that income effects (for instance related to professional status) influence people's answers only from a certain bid level onward.

Actually purchased brands in combination with top-of-mind attributes revealed the existence of two consumer types. Both types did not differ a lot in basic socio-demographic characteristics, stressing the fact that the latter are not at all sufficient to explain the attitudinal and behavioural differences between the '*price-shoppers*' (type 1) and the '*added-value seekers*' (type 2). The types are not to be considered as distinct, as in practice the same consumer can belong to the one or the other type in different situations. Both types represent a different behaviour concerning the issue of domestic milk. Significantly more consumers of type 2 are willing to pay the proposed premium of 10 eurocent. Furthermore, they are likely to be willing to pay

more when the bid level increases, probably because they link a higher price premium with higher quality.

Although the results suggest that identifying milk at the domestic level will affect sales, there are still some important questions that need to be answered. First, will intermediaries and retail be willing to take up milk that is differentiated based on domestic origin and price it accordingly? And if yes, how could (part of) the price premium directly benefit domestic producers?? Second, is a clear origin-certification on milk packaging as such sufficient to create the additional value, or do background reasons have to be communicated to the consumers? Previous research says that consumers are likely to interpret an indication of origin to obtain additional assurances concerning food safety, quality, or other features important to them. The need for additional communication and promotion thus depends on the consumers' beliefs concerning domestic products. When these are perceived to be better than the alternatives, as a result of country's image and of the product's collective reputation, the indication may be quite effective as such. Also, highly ethnocentric consumers will need little extra encouragement to select the domestic product. The extent to which the different motivations play a role for different consumer types and at different bid levels needs further investigation as they may account for the differences found throughout the separate analyses in this paper.

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[1] In the UK, in real terms, the overall decline in the real price of food between 1989 and 1999 was 9.4 percent (Cooper, 2003). In Belgium, the average basic price for milk was 1.6% lower in 2003 than in 2002. In the Netherlands and Germany, the basic price paid to farmers decreased with respectively 2.6% and 5.0% in the same year (Belgische Confederatie van de Zuivelindustrie, 2004).

[2] According to the Farmer's Union, this is the minimum acceptable price, as a lower price would set pressure on quality.

[3] Since May 2004, price control has been extended with origin control ("Can consumers buy Belgian milk and at what price?") to assure the market for Belgian consumption milk in an era where retailers are looking for the cheapest supply, which they often find abroad.

[4] The CAP has been broadened from targeting farmers towards promoting integrated rural development. CAP reform aims to secure a multi-functional, sustainable and competitive agriculture throughout Europe (Levidow & Bijman, 2002).

[5] The payment of a direct income becomes conditional on compliance with specific environmental requirements, which are implemented by national authorities based on particular national demands. As such, there may be additional differentiation across countries.

[6] By eliminating trade barriers, less space remains for countries or continents to set own accents related to animal welfare, use of hormones or genetically modified organisms.

[7] Concentration in the European dairy industry during the last decennia has reshaped the environment in which these firms are operating. The increase of their internal competition lead to a weakened negotiation position towards the retail, thus putting pressure on the milk price that can be paid to the farmers.

[8] Milk is no longer a homogeneous commodity, brands (including supermarket private labels) and differentiated pricing are common (Dhar & Cotterill, 2003).

[9] Only a quarter of the total milk production ends up in the market as consumption milk. The average consumption in 2002 in Belgium of white milk was 52.7 litres per head (Belgische Confederatie van de Zuivelindustrie, 2003).

[10] In 2003, 38.2 million litres of full and semi-skim extra quality milk (AA) have been sold in Belgium (Belgische Confederatie van de Zuivelindustrie, 2004).

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[12] Of the tomato buyers in our sample, 23.1% stated to have taken notice of the origin, against only 17.3% and 12.8% of potato and carrot buyers respectively.

[13] In 2002, the large supermarket chains covered almost 60% of total milk volume purchased in Flanders (GfK Panel Services, Benelux, 2003). As a result, our sample is not representative for the Flemish population as a whole. Not only the hard discounters are left out, but also specialty stores (including markets, farm shops, ...). It is not unlikely that people who buy milk in these other locations have a different purchase behaviour than the people in our sample. Thus, the findings in this paper should not be applied to a fully generalised broader population.

[14] The major limitation of the chosen method is that, due to the hypothetical nature of the questions, they reveal behavioural intentions, not actual behaviour. When implementing a behavioural intention, individuals may often discover binding economic constraints and the intention is not realised (Huang et al., 1997). For instance, survey respondents may ignore or downplay their budget constraint in answering hypothetical questions (Loomis et al., 1994; Azevedo et al., 2003). As a result, the proportion of hypothetical "yes" responses in general overestimates real purchases (Frykblom, 1997; Cummings et al., 1995; Johannesson et al., 1998). Also, the issue of the interviewee's concern for what the interviewer might think may play. For example Kleckner et al. (2002) found that face-to-face surveys provide higher WTP estimates than self-administered surveys, and that WTP varies among interviewers. When interpreting the results, these limitations must be taken into consideration.

[15] We did not determine the maximum; we only observed whether an individual would pay more or less than a particular price level.

[16] Including housemen/wives, pensioners and job seekers.

[17] Although income information in monetary terms would probably have been more useful, we did not ask for this because of the delicate nature of such a question.

[18] But, the percentages may not be considered as a market share, because of the non-representativeness of the sample and because it is not known how much milk the people who answered "yes" buy relative to the rest of the population.

[19] Source: GfK Panel Services, Benelux

[20] The only socio-demographic variable that differed significantly between both types was *Connect Agro/Food* with less people in type 1 being connected with the agricultural or food sector through their job or family than in type 2. Other (attitudinal and behavioural) differences were a higher score on the LOCAL index, a lower frequency of weekend shoppers and a lower shopping frequency as such for type 2 consumers.

[21] This also emerged from a positive correlation between region 1 and connect agro/food (***P<0.01).

[22] Higher-income individuals exhibit a lower marginal utility of income which would separate them on the basis of their willingness to pay for a branded product rather than choosing one showing approximately similar characteristics but significantly lower in price (Bonanno & Lopez, 2004).

[23] Although brand loyalty in literature is often linked with (strong) private label brands (type 2) as opposed to economic and distribution owned brands (type 1), *Loyal* showed no clear difference between both types. The percentage of brand loyal people was 74% and 72% respectively.

[24] MANOVA analysis showed that the between group effects were not significant (Prob = 0.8243): the variables under study did not differ significantly between both bid groups.

Annex 1

Klantnr.: ..... Winkel: .....
Tijdstip: .....

M (# =...) / V (# = ...) met/zonder kind(eren)

Hebt u **confituur** gekocht?	Hebt u **mayonaise** gekocht?	Hebt u **melk** gekocht?
Indien Ja	Indien Ja	Indien Ja
Welk merk?	Welk merk?	Welk merk?
Waarom precies dit merk?: 1. 2. 3.	Waarom precies dat merk?: 1. 2. 3.	Waarom precies dit merk?: 1. 2. 3.
Koopt u altijd dit merk? ❑ Ja ❑ Nee	Koopt u altijd deze soort? ❑ Ja ❑ Nee	Koopt u altijd dit merk? ❑ Ja ❑ Nee
Vanwaar is deze confituur volgens u afkomstig?	Vanwaar is deze mayonaise volgens u afkomstig?	Vanwaar is deze melk volgens u afkomstig? .....
Hebt u **chocolade** gekocht?	Hebt u **yoghurt** gekocht?	Hebt u **appelen** gekocht?
Indien Ja	Indien Ja	Indien Ja
Welk merk?	Welk merk?	Welke soort?
Waarom precies dit merk?: 1. 2. 3.	Waarom precies dit merk?: 1. 2. 3.	Waarom precies deze soort?: 1. 2. 3.
Koopt u altijd dit merk? ❑ Ja ❑ Nee	Koopt u altijd dit merk? ❑ Ja ❑ Nee	Koopt u altijd deze soort? ❑ Ja ❑ Nee
Vanwaar is deze chocolade volgens u afkomstig?	Vanwaar is deze yoghurt volgens u afkomstig?	Vanwaar zijn deze appelen volgens u afkomstig? .....
Hebt u **wortelen** gekocht?	Hebt u **tomaten** gekocht?	Hebt u **aardappelen** gekocht?
Indien Ja	Indien Ja	
Uit het aanbod van wortelen die u kon kiezen, wat heeft u doen beslissen welke u nam? 1. 2. 3.	Uit het aanbod van tomaten die u kon kiezen, wat heeft u doen beslissen welke u nam? 1. 2. 3.	Uit het aanbod van aardappelen die u kon kiezen, wat heeft u doen beslissen welke u nam? 1. 2. 3.
Vanwaar zijn deze wortelen volgens u afkomstig? ..... Hebt u daar speciaal op gelet?	Vanwaar zijn deze tomaten volgens u afkomstig? ..... Hebt u daar speciaal op gelet?	Vanwaar zijn deze aardappelen volgens u afkomstig? ..... Hebt u daar speciaal op gelet? .....

Nu volgen een aantal stellingen waarvan ik graag zou weten in welke mate u het ermee eens bent of niet. De mogelijke antwoorden zijn: Helemaal oneens, Oneens, Neutraal/Geen mening, Eens of Helemaal eens.

	Helemaal oneens Helemaal eens
Het doet er voor mij niet toe of een voedingsproduct inlands is of ingevoerd.	1 2 3 4 5
Ik kies meestal producten waarvoor ik reclame heb gezien.	1 2 3 4 5
Ik heb er goed vertrouwen in dat ingevoerde voedselproducten van dezelfde kwaliteit zijn als deze uit eigen land.	1 2 3 4 5
Wie voedingsproducten van eigen bodem koopt, steunt direct de Belgische/Vlaamse landbouw en voedingssector.	1 2 3 4 5
Ik kies meestal producten waarvan ik weet dat mijn familie/vrienden ze ook kopen.	1 2 3 4 5
We zouden allemaal zoveel mogelijk producten moeten kopen die geproduceerd zijn in België.	1 2 3 4 5
Ik ben gehaast als ik inkopen ga doen	1 2 3 4 5
Ik vind het belangrijk dat mijn supermarkt bij voorkeur Belgische producten inkoopt, ook als deze duurder zijn.	1 2 3 4 5

Wat is uw...

Leeftijd

❑ < 34 ❑ 35-55 ❑ > 55

Opleiding

❑ lager ❑ middelbaar ❑ hoger ❑ universiteit

Beroepssituatie:

❑ Werkzoekend ❑ Zelfstandige
❑ Huisman/vrouw ❑ Gepensioneerd
❑ Arbeider ❑ Bediende ❑Andere:.....

Bent u via uw familie of werk verbonden met de landbouw/voedingssector

❑Ja ❑Nee

Hoe vaak gaat u naar de supermarkt?

❑ Minder dan 1 keer per week
❑ Eén keer per week
❑ Meer dan één keer per week

Hoeveel volwassen personen telt uw gezin? .....
Hoeveel inwonende kinderen? .....

Hoeveel personen in uw gezin hebben een inkomen
(zowel inkomens uit werk, uitkering, pensioen,… tellen mee)? ……

Bent u bereid 5 eurocent meer te betalen voor een bus/fles melk, als u zeker weet dat het Vlaamse of Belgische melk is die u koopt? ...

Tables

Table 1 Future EU target prices for milk

year	2000-04	2004-05	2005-06	2006-07	2007-08	2008 onward
EU target price (3.7% fat content)	30.98	29.22	27.47	25.71	23.96	22.21

Source: Commissie van de Europese Gemeenschappen, COM (2003) 23 definitief. 21 January 2003. Brussel.

Table 2 Characteristics of all milk buyers and per type

		All milk buyers	Type 1	Type 2	Probability $m_{type1} = m_{type2}$
Overall MANOVA group effect (Prob < 0.01*)**					
Regional dummies					
	West-Vlaanderen (sign *)	12.8%	10.5%	16.0%	
	Oost-Vlaanderen (sign ***)	18.7%	22.7%	13.0%	
	Antwerpen (not sign)	10.9%	9.4%	13.0%	P (χ^2) > 0.1
	Vlaams-Brabant (not sign)	39.6%	41.4%	38.0%	
	Limburg (not sign)	18.1%	16.0%	20.0%	
Socio-demographic					
	Age (not sign)	1.92	1.90	2.03	P (t-test) > 0.1
	Education (not sign)	2.72	2.75	2.67	P (t-test) > 0.1
Professional Status	Off-profession (not sign)	29.9%	30.7%	33.3%	
	Self-Employed (sign*)	9.0%	6.8%	13.1%	
	Employee (not sign)	43.9%	42.6%	41.4%	P (χ^2) > 0.1
	Other (not sign)	6.2%	8.0%	4.0%	
	Labourer (not sign)	9.7%	12%	8.0%	
	Connect Agro/Food (sign***)	28.3%	22.9%	38.8%	P (χ^2) < 0.01***
Gender	Female (not sign)	54.5%	53.9%	57%	
	Male&Female (not sign)	19.6%	17.2%	18.0%	P (χ^2) > 0.1
	Male (not sign)	25.5%	28.9%	25.0%	
	Income (not sign)	1.88	1.87	1.86	P (χ^2) > 0.1 P (t-test) > 0.1
Attitudinal variables (product-specific)					
	Loyal (not sign)	74.1%	72.0%	74.8%	P (χ^2) > 0.1
Attitudinal variables (general)					
	Local (sign***)	3.15	3.08	3.34	P (t-test) < 0.05*
	Influenced (not sign)	2.08	2.05	2.16	P (χ^2) > 0.1 P (t-test) > 0.1
Behavioural variables					
	Time (sign **)	52.6%	57.5%	43.0%	P (χ^2) < 0.05**
	Haste (not sign)	3.09	3.15	2.98	P (χ^2) > 0.1
Frequency (sign**)	< once a week	12.8%	11.1%	19.4%	
	once a week	48.0%	47.8%	52.0%	P (χ^2) < 0.05**
	> once a week	38.3%	41.1%	28.6%	

Table 3 Percentage of the consumers willing to pay a bid of *c* eurocent for Belgian-origin certified milk

% YES responses	Milk consumers	All consumers
5 eurocent	47.5	51.1
10 eurocent	51.9	52.6

Table 4 Share of different milk brands in the total milk volume purchased (in %)

	Distribution owned E + PL (+ organic)	Belgian brand	Other
1999	67.7	13.2	19.1
2000	68.7	12.4	18.9
2001	67.9	13.0	19.1
2002	68.3	14.0	17.7
Our sample	56.4	31.1	6.2

Source: GfK Panel Services Benelux (% of volume) and our sample (% of consumers)

Table 5 Importance of top-of-mind attributes for different groups of milk purchasers

	E brands	PL brands	Type 1	M brands	XM brands	Type 2	All milk buyers
n	25	156	181	61	39	100	321
% who named an attribute							
Price	68.0 (a)	46.8 (a)	49.7	13.1 (b)	0.0 (b)	8.0	30.5
Quality	8.0 (a)	9.0 (a)	8.8	9.8 (a)	7.7 (a)	9.0	7.8
Taste	8.0 (a)	9.0 (a)	8.8	34.4 (b)	53.8 (b)	42.0	22.1
Habit	12.0 (a)	14.1 (ac)	13.8	26.2 (bc)	28.2 (bc)	27.0	17.8
Price/ Quality	24.0 (a)	16.0 (a)	17.1	0.0 (b)	0.0 (b)	0.0	9.7
Package	4.0 (a)	4.5 (a)	4.4	9.8 (a)	12.8 (a)	11.0	6.9
% YES responses							
5 eurocent	25 (ac)	51 (b)		41 (bc)	74 (d)		
10 eurocent	31 (a)	43 (a)		64 (b)	85 (b)		
5 eurocent			47.6 [a]			52.9 [a]	
10 eurocent			41.5 [a]			72.9 [b]	

( ) manova test results; [ ] χ^2 test results (a different letter indicates a significant difference at the 10% level)

Table 6 Results of the logistic regression analyses

		Full Sample		5 eurocent		10 eurocent		Type 1		Type 2	
Estimates											
		Par. Est.	**Pr>Chi-Square**	**Par. Est.**	**Pr>Chi-Square**	**Par. Est.**	**Pr>Chi-Square**	**Par. Est.**	**Pr>Chi-Square**	**Par. Est.**	**Pr>Chi-Square**
	Intercept	-3.5200	0.0035	-4.5871	0.0403	-2.0861	0.4309	-2.8001	0.1912	-8.681	0.0250
	Bid	0.1180	0.6822					-0.2393	0.5728	1.5132	0.0334
Regional dummies											
	Oost-Vlaanderen	1.4374	0.0085	3.3532	0.0011	-0.7959	0.4167	1.8543	0.049	1.8434	0.2193
	Antwerpen	0.9530	0.1461	2.4619	0.0306	-0.4871	0.7161	1.3765	0.2168	4.3782	0.0146
	Vlaams-Brabant	1.6218	0.0015	2.9687	0.0033	0.1479	0.8751	1.8968	0.0498	3.4187	0.0133
	Limburg	1.3563	0.0138	2.8096	0.0027	-0.4289	0.681	2.4134	0.012	2.2335	0.0533
Socio-demographic characteristics											
	Age	-0.2433	0.3460	-0.4686	0.225	-0.5383	0.2974	-0.2238	0.5592	-0.1788	0.7910
	Education	-0.6134	0.0058	-1.1894	0.0017	-0.3954	0.314	-0.8145	0.0124	-0.4401	0.3472
Professional status	Cat1	1.7663	0.0065	1.2738	0.2335	3.1864	0.0117	0.4876	0.5822	4.7954	0.0016
	Self-employed	1.8960	0.0154	1.3877	0.286	3.4238	0.0208	2.2944	0.0531	4.1766	0.0083
	Employee	2.2324	0.0006	1.5475	0.149	3.7182	0.0025	1.8651	0.0355	3.6861	0.0063
	Other	1.7059	0.0465	1.0752	0.4615	0.4292	0.8333	1.4195	0.2247		
	Connect Agro/Food	0.5789	0.0952	1.1858	0.0406	0.4507	0.4772	0.4019	0.4615	1.0665	0.2055
Gender	Female			0.5221	0.3879	-1.3844	0.0493	0.4674	0.394	-0.6699	0.4435
	Male&Female			-0.2547	0.7429	0.2826	0.7184	0.6391	0.3658	-0.7107	0.5770
	Income			-0.1995	0.5662	-0.0366	0.9331	-0.3440	0.311	0.392	0.4387
Attitudinal variables (product-specific)											
	Price	-1.1797	0.0004	-1.0289	0.0422	-1.5705	0.0171				

Quality	0.5998	0.2575	0.2748	0.7532	0.309	0.7394				
Taste	0.4312	0.2370	0.4319	0.4846	0.1071	0.8698				
Habit			0.4342	0.5288	-0.0537	0.9396				
Price/Quality			0.1926	0.831	-0.4623	0.636				
Package			-1.8402	0.2012	0.3067	0.7266				
Loyal	-0.9437	0.0070	-0.1658	0.7711	-1.5334	0.0193	-0.8774	0.0748	0.1327	0.8587
Attitudinal variables (general)										
Local	1.0916	0.0001	1.2204	0.0001	1.9228	0.0001	1.5208	0.0001	0.7406	0.0927
Influenced			-0.0933	0.7171	-0.3205	0.2297	-0.3788	0.1145	0.0493	0.8891
Behavioural variables										
Time	1.3071	0.0002	1.7281	0.0054	1.5601	0.0162	1.5577	0.0028	2.8926	0.0029
Haste	-0.2746	0.0141	-0.0464	0.7908	-0.5867	0.0059	-0.4622	0.0097	-0.1878	0.4859
Frequency			0.275	0.4581	-0.6121	0.1816	-0.2484	0.5064	0.169	0.7408
Fit										
-2LOG L for intercept only	415.875		203.452		203.452		223.746		121.205	
-2LOG L for intercept and covariates	302.340		138.295		114.720		147.017		72.646	
Prob of χ^2-test of ML estimation	0.0001		0.0001		0.0001		0.0001		0.0004	
% of concordant pairs	83.0%		85.7%		89.8%		86.8%		88.7%	
Sensitivity (pprob = 0.5)	74.8%		62.9%		70.1%		68.1%		77.6%	
Specificity (pprob = 0.5)	69.1%		68.8%		65.7%		73.6%		58.8%	
Correct classifications (pprob = 0.5)	72.0%		203.452		203.452		71.2%		70.7%	
False POS	28.9%		138.295		114.720		32.9%		23.7%	
False NEG	27.0%		0.0001		0.0001		25.6%		39.4%	

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