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Consumer Willingness to Pay for Swiss Chicken Meat: An In-store Survey to Link Stated and Revealed Buying Behaviour

Bolliger C.¹, Réviron S.¹

¹ ETH Zurich (Swiss Federal Institute of Technology), Agri-Food & Agri-Environmental Economics Group, Switzerland

Abstract— In a global economy food origin is gaining increasing attention as determining purchase criterion in food consumption. Consequently, for many consumers a product's country-of-origin (COO) is an important cue in evaluating both domestic and foreign products. A double-bounded dichotomous choice approach in an in-store setting was used to assess consumers' preference and willingness-to-pay (WTP) for the product attribute "Swiss origin" relative to "European origin" for chicken meat. Data collection took place in the poultry section of six grocery stores in Francophone Switzerland. Sample selection was based on the consumer's purchase decision, that is only actual chicken buyers were questioned. During the survey product data of participants' actual purchase were recorded. Thus, both hypothetical stated and revealed consumer behaviour data were collected. Based on 450 records we highlight four different consumer segments, notably "Loyal Swiss", "Low Price Swiss Zappers", "Price Orientated", and „The Gourmets". At an equal price, 90% of the entire sample prefers Swiss chicken meat. To elicit mean WTP for "Swiss origin" we used logit analysis. The results indicate that mean WTP differs significantly between the highlighted consumer segments. "Loyal Swiss" – medium to high priced Swiss chicken meat consumers – are willing to pay a premium of about 7.40 Euros per kilo chicken breast of Swiss origin. This premium corresponds with actual price differences of at most 7.50 €/kg for Swiss chicken breast relative to European found in the researched grocery stores. "Low Price Swiss Zappers" are willing to pay a premium of 2.10 €/kg chicken breast of Swiss origin. In contrast, the "Price Orientated" and „The Gourmets" are not willing to pay any premium for Swiss origin. This corresponds with their revealed purchase behaviour as they bought imported European chicken. Considering mean WTP for the entire sample of 3.00 €/kg for Swiss origin, we conclude that this is not a good predictor for specific consumer segments. It over-, or underestimates mean WTP of the highlighted consumer segments. Using both stated and revealed consumer behaviour data, we are able to calculate consumer group specific mean WTP which leads to more appropriate results for agribusiness and marketing purposes.

Keywords— contingent valuation method, country-of-origin, willingness-to-pay

I. INTRODUCTION

Food origin is an important product characteristic for many consumers. It affects the significance which consumers associate with distinct foods. With the expanding global economy, aspects concerning country-of-origin (COO) and its communication are gaining in importance especially in the agro-food sector. For many consumers worldwide, origin is a determining purchase criterion in food consumption ([1], [2]). Felzenstein et al. [3] even consider COO as the fifth element in marketing-mix.

In Switzerland, aspects concerning country-of-origin of foods currently draw additional attention because of a free trade agreement in the agro-food sector which is being considered between Switzerland and the European Union (EU). Such an agreement would put Swiss value-added chain in the food sector and Swiss agriculture in particular under a strong pressure regarding pricing and product placement on domestic market.

Consequently, Swiss agriculture needs to evaluate the potential of their produce on domestic market under such a new framework, considering the fact that comparable EU-products at partially multiple reduced rate push on Swiss market. From this perspective it is of vital importance to know domestic consumers and their needs, preferences and willingness-to-pay (WTP) with regard to Swiss agricultural and food products. If consumers prefer domestic agricultural products and associate Swiss origin with an additional benefit in connection with a higher WTP, potentials arise regarding product positioning and marketing.

We investigated this issue in regard to chicken meat in an in-store consumer survey in French speaking Switzerland. The results of our investigation are the subject of this contribution. To estimate consumers' preference and WTP regarding the product attribute "Swiss origin" we used a double-bounded dichotomous choice approach

which was adopted by Loureiro et al. [4]. Unlike Loureiro et al. [4], sample selection in our approach was solely based on the actual consumer's purchase decision, meaning that only actual chicken buyers were questioned. This enabled us to collect both stated and revealed consumer behaviour data.

The main objectives of the paper are twofold: First, we introduce our sample selection approach, second, we analyse factors influencing consumers' preferences and WTP for Swiss chicken. The article is structured as follows: An overview of relevant country-of-origin literature is given. Then data collection and methodological aspects are presented followed by presenting empirical results. We end with a short conclusion.

II. COUNTRY-OF-ORIGIN FOR FOOD

Food products have a high proportion of experience and an increasing share of credence attributes ([5], [6]). Consumers make decisions about the quality of products based on a systematic process of acquisition, evaluation and integration of product information or cues. For this reason it becomes apparent why extrinsic product cues gain in importance within food. Country-of-origin is regarded as such a cue. In the literature however, COO has been identified as both extrinsic indicator and credence attribute respectively. The distinction between extrinsic cue and credence attribute in the COO literature depends largely on the use of different theoretical frameworks. Past research shows that the origin of food influences consumers' decision-making in substantial and complex ways with regard to attitudes, evaluation, and willingness-to-pay [7].

A. Attitudes

In regard to attitudes Gürhan-Canli and Masheswaran [8] examine COO perception under different degrees of motivation to process available information. The authors conclude that COO perception is more favourable under low motivation because less effort is needed in attribute processing. Based on a mixed logit model, Alfnes [9] showed, that on average, Norwegian consumers preferred domestic or Swedish beef to beef from more distant countries. In addition, beef from developed countries was preferred to beef from less developed countries such as Botswana. These

findings are in line with Juric and Worsley [10] who found that food from neighbouring countries are perceived as being superior to food from more distant countries which are due to similar cultural beliefs and areal proximity. Thus, attitudes toward COO is influenced by personal degree of motivation, cultural and areal proximity and the country-of-origins' development status.

B. Evaluation

In a meta-analysis Liefeld [11] found a generally positive impact of COO with regard to product evaluation. Becker [12] investigated in a large European consumer survey 3000 participants in six EU countries (Germany, Ireland, Italy, Spain, Sweden, and the UK) considering the helpfulness of intrinsic and extrinsic cues in assessing the eating quality of meat (beef, pork, and chicken) while shopping. On average, COO, alongside colour and place of purchase, are regarded as most helpful in assessing both eating quality and food safety concerns of meat. But distinct differences between the researched countries were observed. In Germany and Sweden COO is the most important factor determining both eating quality and safety aspects. In the UK, however, colour, leanness, or place of purchase was regarded as most important.

Using data from mail surveys in France, Germany and the UK, Roosen et al. [13] determined European consumers' preference for beef labelling strategies associated with origin-labelling, private brands, and mandatory labelling of beef from cattle fed genetically modified corn. Consumers in France and Germany indicated that the origin of their beef was more important than any other product attribute such as brand, price, marbling, or fat content. In the UK however, colour, price and fat content were most important. These findings are in line with Becker [12]. Verbeke and Ward [14] conducted a survey to explore the importance of traceability, COO, and several beef quality cues in Belgium. Survey participants expressed more interest in labelling cues denoting quality and quality standards than in labelling cues related to traceability and origin.

Verlegh and Steenkamp [15] found that the value of COO information in product evaluation tends to decrease as information is provided about other product attributes. In their meta-analysis of COO-studies, the authors indicate that besides cognitive quality related information, COO information also provides affective and normative

information. In a conjoint experiment, Tanner Ehmke et al. [16] elicit consumers' preferences of information on COO, on organic production, and genetic modification (GM) in developed (France, USA) and developing countries (China, Niger). The authors found that COO information is not as important as genetically modified content information (France, USA, and Niger) or organic production (China). Thus, for individuals with quality and food safety information needs, COO information is relatively less important with regard to GM or organic food information.

C. Willingness-to-Pay

Whether for safety, quality or an origin-based ideology, country-of-origin for foodstuff has been associated with positive willingness to pay for the own country ([17], [18], [19], [20], [21], [22], [23]). In a sample of Colorado (USA) consumers, Loureiro and Umberger [19] estimated in a dichotomous choice set mean willingness to pay for a US mandatory labelling program, as well as for "US Certified" steak and hamburger. The authors conclude that respondents indicated they were willing to pay on average large premiums to obtain "US Certified" steak and hamburger. In another WTP study on COO-Labelling, experimental auction method was used to elicit Chicago and Denver consumers' preferences and premiums for COOL [17]. About 70% of the consumers were willing to pay an average premium of about 20% for a "USA Guaranteed" steak over an unlabeled, generic steak. In the most expansive study Loureiro and Umberger [20] used dichotomous choice set to assess continental US consumers to indicate their willingness to pay for COOL program applied to beef steaks, chicken breasts, and pork chops, all labelled as "US Certified". In this case, consumers surveyed were only willing to pay average premiums of 2.5-2.9% over the original market price to obtain "US Certified". Finally, Mabiso et al. [22] found in an experimental auction that COOL garnered average premiums for apples and tomatoes.

All of the WTP studies utilized common contingent valuation or experimental auction methods, which have been shown to be very useful for determining values for both nonmarket and market goods. Nevertheless, in evaluating the ability of the premiums elicited in the WTP studies, one should also consider the importance of country of origin and source assurance relative to other experience and search attributes [18]. Thus, based on a

choice experiment Loureiro and Umberger [21] concluded that US consumers' preference and WTP for COO labelled rib eye beef steak is relative in comparison with other meat attributes such as traceability, tenderness, and food safety.

Regarding the different studies above, origin can be considered as an important attribute or cue in consumers' evaluating process for food quality and safety aspects. Furthermore, consumers are willing to pay a certain premium for country-of-origin. From a marketing point of view these findings are relevant, but the impact of origin along with different consumer segments, and product positioning has not been assessed. Our research is addressed to this gap.

III. DATA COLLECTION AND PRESENTATION

Our survey was tested in December 2006. The actual survey took place between 5th and 20th January 2007, therefore just prior to the second bird flu epidemic which restarted in Europe at the end of January. The survey took place in Francophone Switzerland, in the poultry sections of six grocery stores of the largest Swiss retailer Migros. The stores were nearly identical in respect to size, selection, and product presentation. An interesting characteristic of the grocery stores where we surveyed was the large product and price varieties offered, including different qualities (conventional, organic, animal friendly, origin) and different chicken meat types (entire chicken, chicken leg, chicken cutlets). This allowed consumers to consider a variety of substitutes among chicken meat. For Swiss standards the stores can be characterized as semi-urban or urban, located either in the city centre (e.g. Lausanne) or in the agglomeration (e.g. Geneva). All in all, 548 poultry buyers were questioned; only those 450 participants were considered for our final sample, however, who actually bought chicken meat. Buyers of other poultry such as turkey were excluded. A summary of the statistical data and a description of the variables are given in table 1.

The majority of the participants was female (66%), Swiss citizens (70%), and main household shoppers (75%), belonged to the 40-49 age group (25%), and had children under the age of 18 living in their households (46%). 36% of the participants had an education level which included 9 years of basic education as well as an apprenticeship. The monthly average household

Table 1 Summary Statistics of the Demographic Variables

Variable Name	Description	Frequency	Mean	Standard Deviation
Gender	1 = female 0 = male	= 66.0% = 34.0%		
Age Groups	1 = 18 - 29 years old 2 = 30 - 39 years old 3 = 40 - 49 years old 4 = 50 - 59 years old 5 = > 60 years old	= 12.7% = 22.0% = 24.9% = 21.3% = 19.1%	3.12	1.301
Origin	1 = Swiss citizen 0 = other	= 70.2% = 29.8%		
Education	1 = mandatory basic education 2 = vocational training 3 = grammar school 4 = university degree	= 25.6% = 35.6% = 11.6% = 27.3%	3.36	1.209
Family Size	1 = 1 person 2 = 2 persons 3 = 3 persons 4 = 4 persons 5 = > 4 persons	= 13.8% = 36.0% = 15.8% = 24.2% = 10.2%	2.81	1.237
Children	1 = household with children < 18 years 0 = other	= 46.4% = 53.6%		
Household Income	1 = < 1800 € / month 2 = 1800 - 3100 € / month 3 = 3100 - 4400 € / month 4 = 4400 - 5700 € / month 5 = > 5700 € / month	= 6.9% = 28.0% = 29.8% = 20.0% = 15.3%	3.09	1.168
Shopper	1 = main shopper 0 = other	= 75.1% = 24.9%		

income was between 3100 and 4400 Euros.¹

In numerous aspects our sample differs from the demographic structure of the total population of francophone Switzerland: one, the percentage of foreigners is slightly higher, and two, the number of children in one household is significantly higher. On the other hand, the education level and the household income are somewhat lower. In our sample the average household income is slightly above 3100 € a month which is about 500 € lower compared to the entire francophone population average household income. These differences can be explained by the fact that families, as well as foreigners often have a tighter budget and therefore opt for chicken meat, the cheapest meat available in Switzerland (cf. table 2). Besides the socio-demographic variables, information about participants' ecological and ethological concerns, as well

as the actual purchase decision was collected during the survey. Additionally, the participants were asked

Table 2 Comparison of Socio-demographic Characteristic

Socio-demographic Characteristic		Sample	Francophone Population
Female		66.0%	51.36% ¹⁾
Non-Swiss Citizens		29.8%	26.3% ¹⁾
Average Household Size (Persons)		2.81	2.24 ²⁾
Households with Children < 18 Years		46.4%	34.67% ²⁾
Household Income (€ / Month)		3100 - 4400	3730 ³⁾
Age Groups	1 = 18 - 29 years	= 12.7%	= 18.1% ⁴⁾
	2 = 30 - 39 years	= 22.0%	= 18.3% ⁴⁾
	3 = 40 - 49 years	= 24.9%	= 20.1% ⁴⁾
	4 = 50 - 59 years	= 21.3%	= 16.2% ⁴⁾
	5 = > 60 years	= 19.1%	= 27.3% ⁴⁾

1. Originally, all prices, household incomes, bids, and willingness-to-pay estimates were collected in Swiss Francs. We convert all data into Euro by dividing the data given in Swiss Francs with a factor of 1.6.

1) Federal Statistical Office (FSO), year 2006; 2) FSO, year 2000; 3) FSO, year 2008; 4) FSO, year 2006; based on the total Swiss adult population

about their three most important decision criteria when buying chicken meat. Further, they were asked to rank them from 1 to 3 (cf. table 3). It became apparent that the product price was the most important primary decision criterion (27%), followed by product appearance (25%). The origin and the quality of the meat were each named by a fifth as their most important decision criterion. Therefore, in the choice of a product, classic search characteristics take precedence over experience or credence attributes.

To elicit participants' attitudes toward ecological, ethological, and sanitary product aspects trade-off scenarios were used. For this purpose we used a five-tier likert scale. One stood for „lowest price is all important“, and five stood for either “short route of transport is all-important”, “animal welfare is all-important”, or “sanitary product quality is all-important”. For today's customers a conflict of interest between personal value judgments and price incentives has become a daily reality in most purchase decisions, since nowadays a

more expensive, but more ecologically and/or ethically produced competing product exists almost without exception alongside a standard product.

Regarding the individual's ratings given to these different product aspects, a clear picture appears. The more directly an individual is affected by a product aspect, the more important it becomes. This is emphasized in that the highest average listing is given to sanitary product quality. In other words, for 73% of the participants, product quality is all-important. Concerning animal welfare, this number is halved to 46%, and for a mere 28% a short route of transportation is all-important. A summary of the statistical data and a description of the variables are given in table 3.

Data of the actually purchased chicken product was recorded only with participants' consent. Recorded product data consisted of the type of chicken meat (e.g. entire, breast, leg), the price per kilo and price per packaging unit, the weight, the brand or label, as well as product origin (cf. table 4).

Table 3 Summary Statistics of Consumer Buying Criterion and Consumer Concerns

Variable Name	Description	Scaled Values	Mean	Standard Deviation
Rank 1	Stated most important buying criterion	1 = price per kilo or unit = 26.9% 2 = brand or label = 6.4% 3 = appearance = 25.1% 4 = eating quality = 20.4% 5 = product origin = 20.7% 6 = others = 0.4%		
Rank 2	Stated second most important buying criterion	1 = price per kilo or unit = 21.1% 2 = brand or label = 6.4% 3 = appearance = 33.6% 4 = eating quality = 19.6% 5 = product origin = 18.7% 6 = others = 0.7%		
Transport	Importance of short transportation vs. low product price	1 = lowest price is all important = 7.8% 2 = = 7.6% 3 = = 32.0% 4 = = 24.2% 5 = short transport is all important = 28.4%	3.58	1.197
Animal Welfare	Importance of animal welfare vs. low product price	1 = lowest price is all important = 3.8% 2 = = 3.3% 3 = = 20.9% 4 = = 26.0% 5 = animal welfare is all important = 46.0%	4.07	1.068
Sanitary Product Quality	Importance of sanitary product quality vs. low product price	1 = lowest price is all important = 3.8% 2 = = 3.3% 3 = = 20.9% 4 = = 26.0% 5 = sanitary quality is all important = 46.0%	4.07	1.068

Table 4 Summary Statistics of Purchased Chicken Products

Variable Name	Description	Scaled Values	Mean	Standard Deviation
Product Brand		1 = Mère Joséphine / Bio = 51.1% 2 = B-Budget = 10.2% 3 = EU-Import / Don Pollo / M-Pic = 27.1% 4 = St. Sever / Le Gaulois = 11.6%	1.99	1.117
Product Price	Segmentation based on price per kilo in Swiss Francs	1 = ≥ 16.25 € / kilo = 22.4% 2 = < 16.25 € and > 11.25 € = 26.4% 3 = ≤ 11.25 € and ≥ 9.40 € = 14.9% 4 = < 9.40 € and ≥ 8.75 € = 4.9% 5 = ≤ 8.75 € = 31.3%	2.96	1.571
Product Origin	Fresh chicken meat was only available from two origins	1 = EU = 39.6% 2 = CH = 60.4%		
Product Type	Rough distinction between entire and cut (e.g. breast) chicken meat	1 = Cut chicken = 71.6% 2 = Entire chicken = 28.4%		

IV. METHODOLOGICAL APPROACH

Our methodological approach to elicit willingness-to-pay estimates for the product attribute “Swiss origin” with regard to chicken meat oriented itself largely along the survey design applied by Loureiro et al. [4]. To assess WTP for Swiss chicken breast we also applied on a double-bounded dichotomous choice model (cf figure 1). In this procedure the participants are questioned about two bids. The amount of the second bid is contingent upon the answer of the first bid. Survey participants are asked initially whether they would be willing to pay a given sum of money (b_1), or not; then they are questioned about a second sum of money which is higher (b_2^H) than the first ($b_2^H > b_1$) – if the first bid was accepted – and lower (b_2^L) than the first ($b_2^L < b_1$) – if the first bid was turned down [24]. The set of possible outcomes, here termed S^{DR} , contains four answer sequences to the two WTP questions: $S^{DR} = \{ („No, No“), („No, Yes“), („Yes, No“), („Yes, Yes“) \}$.

The survey structure of the double-bounded dichotomous choice model thus offers four possible intervals for the actual willingness-to-pay. Based on the depicted procedure, the following discrete outcomes are observable:

$$S^{DR} = D = \begin{cases} 1 & WTP < b_2^L \\ 2 & b_2^L \leq WTP < b_1 \\ 3 & b_1 \leq WTP < b_2^H \\ 4 & b_2^H \leq WTP \end{cases} \quad (1)$$

WTP here describes the individual willingness-to-pay for Swiss chicken cutlets. The WTP function can be illustrated as follows:

$$WTP = \alpha + \rho b + \beta z + \varepsilon \quad (2)$$

Here, b represents the last bid level which the participant was offered. The observable characteristics of the individual are represented by the column vector z (linearity is presupposed). ε is a random variable accounting for unobservable characteristics with $\varepsilon \sim G(0, \sigma^2)$, where $G(0, \sigma^2)$ denotes a cumulative distribution function with mean zero and variance σ^2 , and α , ρ , and β are the parameters which are to be calculated.

To evaluate the double-bounded dichotomous choice model used here, a log-likelihood function is calculated. To calculate the likelihood function, the probability of the four elements of the set S^{DR} , resp. D , are required, assuming normal distribution ([4], [24]).

$$prob(D_i = j) = \begin{cases} \pi_n^{no,no} = G(\alpha + \rho b_2^L + \beta z) \\ \pi_n^{no,yes} = G(\alpha + \rho b_1 + \beta z) \\ \quad - G(\alpha + \rho b_2^L + \beta z) \\ \pi_n^{yes,no} = G(\alpha + \rho b_2^H + \beta z) \\ \quad - G(\alpha + \rho b_1 + \beta z) \\ \pi_n^{yes,yes} = 1 - G(\alpha + \rho b_2^H + \beta z) \end{cases} \quad (3)$$

for $j = \{1, 2, 3, 4\}$

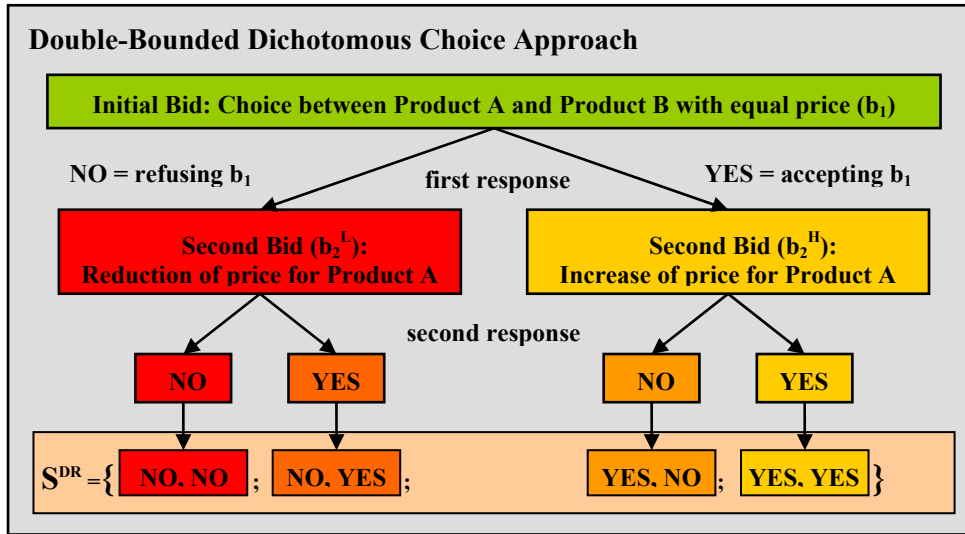


Fig. 1 Design of a Double-Bounded Dichotomous Choice Contingent Valuation Model

The corresponding log-likelihood function is:

$$L = \sum \left\{ \begin{aligned} & I_{1,n}^{no,no} * \ln G(\alpha + \rho b_2^L + \beta z) \\ & + I_{2,n}^{no,yes} * \ln [G(\alpha + \rho b_1 + \beta z) - G(\alpha + \rho b_2^L + \beta z)] \\ & + I_{3,n}^{yes,no} * \ln [G(\alpha + \rho b_2^H + \beta z) - G(\alpha + \rho b_1 + \beta z)] \\ & + I_{4,n}^{yes,yes} * \ln [1 - G(\alpha + \rho b_2^H + \beta z)] \end{aligned} \right\} \quad (4)$$

I_C is an indicator function for the event C , $D_i = j$ indicates the j th alternative, which occurred, and i represents individual i . In the empirical implementation of the model, for $G(\cdot)$ standard logistic distribution with mean zero and variance $\pi^2/3$ is applied.

Compared to the single bounded approach, the use of the double-bounded model offers various advantages. The double-bounded choice model provides more information about an individual's actual or true WTP, since the survey of two bids provides two observation points for the assessment of the WTP [24]. In this way, a narrower interval around an individual's unobservable actual WTP can be estimated than is possible with the single-bounded model. If the bids concerning the WTP are twice accepted or twice turned down, however, realistic upper, respectively lower, WTP limits are to be qualified by the observer, as is the case

with the single-bounded choice model. Beside, through the lowering or increasing of the bid, depending on the answer to the first question, a rather uninformative bid design for the first questioning format can be calibrated. This is what Kanninen [25] calls the "second chance". Moreover, Hanemann et al. [26] show that the double-bounded dichotomous choice model is asymptotically more efficient than the single-bounded model. In comparison to other formats, one key advantage of the dichotomous choice format is its incentive compatibility [27], since empirical research shows that in hypothetical WTP surveys, the consumer's statements concerning the same products were significantly influenced by the actual buying environment [28]. Carson et al. [29] argue that data collection on decision-making processes should preferably take place in a realistic environment, as consumers often develop their preferences in reaction to the decision-making environment and not based on stable value judgments (also, cf. [30], [31]). According to Hoehn and Randall [32], no incentive exists for strategic behaviour under "realistic conditions" in dichotomous choice model surveys. A further advantage of the dichotomous choice format is its simplicity. The all-or-nothing decision resembles everyday buying behaviour in supermarkets, in which consumers are confronted with the choice of buying a product or leaving it on the shelf [24].

Following Loureiro et al. [4], we used a double-bounded dichotomous choice contingent valuation

method in an in-store-context. In our approach the sample selection is unlike Loureiro et al. [4] solely based on actual consumers purchase decision, meaning that only actual chicken buyers are asked. Specifically this means that the interviewer in the poultry section remains an observer in the background until the consumer has revealed his purchase decision by placing a poultry product in his shopping cart. The actual questioning takes place immediately after this act of purchase. During the survey, the product data (e.g., price / kilo, product origin) of the actual purchase were recorded. Thus, it enabled us to collect hypothetical stated and actually revealed consumer behaviour data, resp. the participant's purchase decision. By collecting data from consumer who actually purchased chicken meat we hoped to better obtain consumers' true preferences about food origin. Besides, we believe to have established an additional connection to reality of the survey context. The actual purchasing behaviour, revealed through placing a poultry product in the shopping cart and thus attracting the attention of the interviewer, served as the only criterion to select our sample. This way, all non-poultry buyers could be ruled out, thus increasing the survey's validity.

Based on the recorded data of participants' actual purchase during the survey, hypothetical statements can subsequently be compared with actual purchase behaviour. The reason for the development of this survey approach was that the contingent valuation methods (CVM) typically led to a systematic overestimation of the actual WTP, the extent varying depending on the product type and survey design ([33], [34], [35]). Besides further methodological problems of the CVM, the so called "hypothetical bias" seems to be the main cause for this overestimation. The "hypothetical bias" results from payments that are verbally professed, but not actually made [36]. In the context of using the direct procedure to survey the WTP (stated preference techniques) – like the used double-bounded dichotomous choice model – the hypothetical or fictitious character of the decision situation is seen as the strongest drawback, as the professed WTP does not lead to an actual consequence for the participant. Meanwhile, however, several techniques exist to calibrate the "hypothetical bias" ([37], [38], [39], [40], [41]). With the dichotomous choice model the "certainty calibration" is applied. Here several different forms were developed. The approach by Champ and

Bishop [39], which served to calibrate hypothetically professed statements when buying wind energy, appears to be the most convincing. To calibrate the hypothetical setting, a certainty question was posed to all those participants who accepted the hypothetical purchase opportunity. During the follow-up question the participant was asked to assess the quality of his own answer on a scale from one to ten.

We believe that the strategy that we developed – selecting participants after their revealed purchase decision in a realistic buying environment and recording the product data of the chosen product – leads to a better correlation between the actual and the verbally expressed purchase behaviour, at the same time minimizing the courtesy answers. Besides, it possesses ex ante and ex post calibration mechanisms. Ex ante, because of the exclusion of non-buyers, besides, the recording of the actual purchase decision leads the subject to reflect upon his own behaviour prior to the hypothetical WTP survey questions. This prior reflection could lead to a more realistic assessment of the individual's preferences and WTP. Ex post thus, there is the option of comparing hypothetical stated and actual buying behaviour after the survey.

In our survey, the bid design was set according to actual product prices as found in the researched stores. The price per kilogram of the standard chicken cutlets from both places of origin served as reference level. For the first bid (b_1) the same price was set for both products, which implied a price difference of zero to the consumer. Thus, consumers first could choose their preferred origin of chicken cutlet based on equal price. If consumers expressed a preference for Swiss cutlets, they then were offered a second bid (b_2^H) with a price increase in favour of the meat of Swiss origin. The consumer was randomly given one of three bids – price increase of +4.40, +6.25, or +8.10 € / kg – which we had previously set according to actual differences between the chicken cutlets of the two different origins. However, if the customer instead opted for the chicken cutlet of "EU" origin, a second bid (b_2^L) was given with a price reduction for the chicken cutlet of Swiss origin. Here, too, the customer was randomly given one of three bids – price reduction of -4.40, -6.25, or -8.10 € / kg – which we had previously set.²

2. In the researched stores the price for standard chicken breasts ranged between 13.75 and 21.25 € / kilo. The price difference between the standard chicken breasts with Swiss origin com-

V. RESULTS

A. Model Specification

The object of this contribution is to analyse and estimate willingness-to-pay for Swiss chicken meat. Based on the first bid (b_1 = equal price) we found that 90% of our respondents' had a preference for Swiss chicken breast. Because of this strong preference for Swiss chicken meat, we simplified our initial model (2) by only including consumers who accepted the first bid. In pursuit of this fact, we estimate a single-bounded logit model with bid (b_2^H), latent, and continuous unobservable variable (WTP_i^*) which could be interpreted as consumers' desire for Swiss origin (Loureiro and Umberger [19]). Thus, observable variable is modelled by the researcher and the latent model is represented by (5):

$$WTP_i = I_{(0, \infty)}(WTP^*), \quad (5)$$

where $I_{(0, \infty)}$ is an indicator variable that restricts the observable WTP to the positive domain, and $WTP_i = \beta z_i + \varepsilon_i$. Therefore,

$$WTP_i = \begin{cases} 1 \\ 0 \end{cases} \text{ if } WTP_i = \beta z_i + \varepsilon_i \begin{cases} > \\ \leq \end{cases} 0 \text{ with } I_{(0, \infty)}. \quad (6)$$

The ε_i are unobservable random variables, following a logistic distribution with mean zero and variance $\pi^2/3$ (Wagner [24]). A "yes" response is only observed if the latent variable is greater than zero. Our final WTP-function (7) follows equation (2) restricted by (6):

$$WTP_i = \alpha_0 + \rho b_i + \beta z_i + \varepsilon_i \quad (7)$$

In our WTP-function, the explanatory variable z is characterized solely by non socio-demographic factors. The empirical formulation of equation (7) is finally formulated as:

$$WTP_i = \alpha_0 + \rho Bid_i + \beta_1 Transport_i + \beta_2 Rank_1_i + \beta_3 Rank_2_i + \beta_4 Product_Origin_i + \varepsilon_i, \quad (8)$$

where Bid_i represents the random bid (+4.40, +6.25, or +8.10 € / kg) offered to each consumer who denoted yes in the first bid. $Transport_i$ is the respondent's transportation attitude, $Rank_1$ and $Rank_2$ stands for the most and second most important consumers' buying criterion whereas within both $Rank_1_i$ and $Rank_2_i$ only two criteria of each variable have been significant. But, these parameters account for the significance of the variables $Rank_1$ and $Rank_2$ in the model as a whole. The parameter-value $Product_Origin_i$ represents the origin of the product which was actually bought by the consumer. It might be surprising that no socio-demographic variable is significant enough to enter the model. But, these findings are consistent with Karrer [42] who came to the same conclusion in her investigation concerning ecological beef consumption in Switzerland.

B. Model Estimate

Estimation results concerning the factors affecting WTP function are presented in table 5. All coefficients are significant at a nominal .05 level and have the expected signs. Buying criterion *origin* within *Rank 1* ($\beta_{21} = 1.251$) has a positive relationship with the WTP level. That means if a consumer states *origin* as his most important buying criterion, he is also willing to pay more for chicken breast with Swiss origin. The same positive effect has been found for the variables *Transport* and *Product_Origin of actual purchase*. Thus, consumers' who actually bought Swiss chicken meat are revealed to pay a premium for Swiss origin. The same is in effect with short transportation which can be considered from ecological or animal welfare reasons. On the other hand the *bid* amount, buying criterion *price* within *Rank 1* and *Rank 2*, as well as *appearance* within *Rank 2* have a negative relationship with the WTP level. This is consistent since the higher the bid amount presented to the consumer, the lower the likelihood that the consumer will agree. In addition, the buying criterion *price* means, that the consumer is price sensitive while purchasing which results in a negative effect on WTP. The model predicts 73.3% consumers correctly.

pared to EU origin normally lies at +6.25 € / kilo. In the case of special offers on CH chicken cutlets, the kilo is approx. 4.40 € more expensive than the comparable EU product. In reality a price mark-up of +8.10 € / kg does not exist, and was merely supposed to assess the upper limit of the WTP.

Table 5 Equation Model for Swiss Origin for Chicken

Parameter	Estimates	Odd-Ratio
α_0	-0.746	
ρ (Bid)	-0.141**	0.869
β_1 (Transport)	0.422***	1.525
β_{21} (Rank 1: origin)	1.251***	3.494
β_{22} (Rank 1: product price)	-0.847**	0.429
β_{31} (Rank 2: appearance)	-0.867**	0.420
β_{32} (Rank 2: product price)	-1.128**	0.324
β_4 (product origin of actual purchase)	0.559**	1.749
Log Likelihood	-212.506	
Restricted Log Likelihood	-268.497	
Likelihood Ratio Test, $\chi^2_{[7]}$	110.982	
% of Correct Predictions	73.3%	

Note: Double and triple asterisks (*) denote statistical significance at least at $\alpha = 0.05$, and 0.001.

C. Profiles of Consumer Segments

The insights gained based on our model specification finally guided us to the hypothesis that within our sample, different consumer segments with varied preferences and WTP's might exist. As a result of recording actual purchase data we have been able to identify different consumer segments. Thus, we used purchased brand or label, origin, price per kilo and different product type of chicken meat (entire chicken or cut chicken) as segmentation criteria (cf. Table 4). As a result we found for different consumer segments:

- “*Loyal Swiss*”: For these consumers, Swiss origin is the most important product attribute, and purchased product price is medium to high.
- “*Low Price Swiss Zappers*”: Price sensitive consumers who buy low priced or sales promotion products. Nevertheless, Swiss origin influence buying behaviour. Thus, some prefer an entire chicken if it is Swiss instead of an imported chicken breast.
- “*Price Orientated*”: Consumers who look for and buy an imported specific piece of chicken meat if at a lower price than the Swiss complement.
- “*The Gourmets*”: Consumers who actually buy French labelled products because of reputation of tasty and superior quality. Price is high, equal to Swiss origin.

C. Mean WTP

Following a more marketing orientated approach while using dichotomous choice models, we assume that the identified consumer segments have different mean WTPs' for Swiss origin. Thus, instead of estimating one single mean WTP based on the entire sample we consider it reasonable to elicit a different mean WTP for each highlighted consumer segment. As Figure 2 shows, the frequency of accepting a given bid for Swiss origin differs between the consumer segments. The frequency of accepting a given bid for “*Loyal Swiss*” is much higher than for the “*Entire Sample*”.

In order to calculate the mean WTP, we follow Haneemann's [43] and Wagner's [24] approach. The likelihood function (7) is restricted by setting all β 's equal zero, leaving only the constant term and the bid term in the model. Then the parameters α' and ρ' are estimated via maximum likelihood, and the mean WTP is calculated as $-\alpha' / \rho'$. This formula allows for the mean WTP to be negative which will be the case, if consumers on average are not willing to pay a premium for Swiss origin [4].

First we calculated mean WTP for the entire sample, second for each consumer segment. In Table 6 the different mean WTP's are presented. We found that the “*Loyal Swiss*” are willing to pay a premium of about 7.40 € per kilo for a chicken breast with Swiss origin. Considering actual price premium of at most 7.50 € per kilo for Swiss vis-à-vis EU chicken breast our estimate seems realistic. Besides, we found that “*Low Price Swiss Zappers*” are also willing to pay a small price premium for Swiss origin of 2.10 € per kilo. This was not expected, but seems rather logic considering the fact that entire Swiss chicken are sold in this segment. Both, the “*Price Orientated*” and “*The Gourmets*” are not willing to pay any premium. Taking the mean WTP of the entire sample in account, which shows a general WTP a price premium (3 €), some consumer segments are under, some overestimated.

Table 6 WTP estimates for different consumer segments

Parameter	α'	ρ'	$-\alpha' / \rho'$ in CHF
Entire Sample	0.472	- 0.099	4.76768
Swiss Zappers	0.434	- 0.128	3.39063
Loyal Swiss	1.565	- 0.132	11.85606
Price Orientated	- 0.579	- 0.040	- 14.47500
The Gourmets	- 0.842	- 0.009	- 93.55556

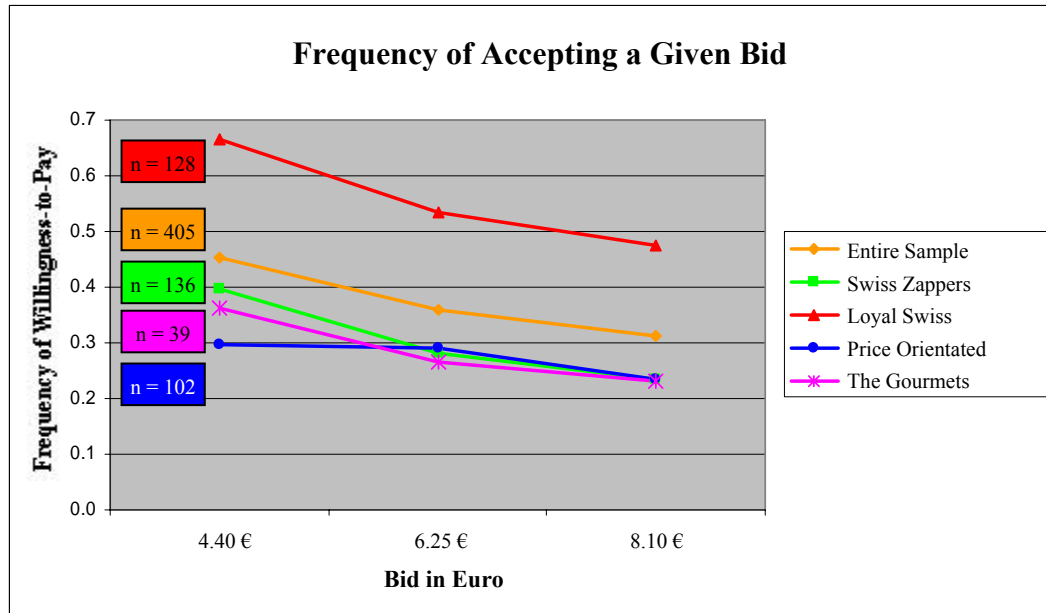


Fig. 2 Frequency of accepting the given willingness-to-pay-bid, given that Swiss origin was chosen as the first alternative

VI. CONCLUSION

In this paper, we consider factors that induce consumers to pay a premium for Swiss chicken meat. Our sample includes shoppers at six grocery stores in French-speaking part of Switzerland. Based on a double-bounded dichotomous choice model we found that 90% of our sample prefers chicken meat of Swiss origin at an equal price. Because of this strong preference for Swiss chicken meat, we then estimated, based on the second bid, a single-bounded logit model to calculate consumers' mean WTP for Swiss origin, and to analyze the factors affecting the decision to pay a premium. We found that the explanatory variable in the willingness-to-pay function is characterized solely by exogenous, non socio-demographic variables like product origin of actual purchase, attitudes toward short transportation, and stated main buying criteria (parameters of RANK 1 and 2).

Dichotomous choice approach used in our research has been shown to be very promising for determining nonmarket values such as country-of-origin. Consumers' buying desire in favour of this nonmarket product attribute or cue is contrasted by budget restriction and attitude toward product price. The method used allows for reliable measuring this weighing up against each other of

country-of-origin and price and makes the measuring of the territory quality rent for "Swissness" possible.

Anchoring our sample selection to actual purchase enforce reliability of our methodological approach and its measurement. Questions concerning country-of-origin aspects are very sensitive, emotional, and depend largely on the product investigated. Because of that, such questions are hardly to assess far away from actual purchase decision.

Besides, recording of actual purchase enables us to highlight four different consumer segments which have different preferences for Swiss origin. We find large differences in WTP between the four consumer segments. Mean willingness to pay for the entire sample of 3.00 € per kilo over-, or underestimates willingness to pay of the four different consumer segments, respectively. In contrast, "Loyal Swiss" are willing to pay a high premium of about 7.40 € per kilo for own country chicken meat and value Swiss origin as most important buying criteria. Thus, we find that chicken meat is largely differentiated based on the product characteristic "country-of-origin". The product attribute COO is for a certain consumer segment an important characteristic when purchasing chicken meat. The results are consistent with previous results found in the literature (e.g. [12], [19], [20], [21]). Thus, own COO is within meat purchase a highly rele-

vant decision criterion. Some consumers considered own country chicken meat as trustworthy because of better food safety and product quality. That is the reason why some consumers are willing to pay a large premium for country-of-origin aspects.

For agribusiness and marketers these insights open up positioning potentials and are relevant for strategic marketing and communication purposes now and in case of a market liberalization. Because of its simplicity we consider the use of our sample selection approach in connection with the dichotomous choice format valid for marketing research purposes. As a final remark, we conclude that with the methodological approach developed here it is possible to relate revealed purchase data to hypothetical stated preferences. Principally based on this approach we are able to calculate not only the mean WTP of the entire sample but also of specific consumer groups which finally leads to more appropriate results for agribusiness and marketing purposes. Nevertheless further research is needed to strengthen the methodological design.

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- Author: Conradin Bolliger
 - Institute: ETH Zurich (Swiss Federal Institute of Technology), Agri-Food & Agri-Environmental Economics Group
 - Street: Sonneggstrasse 33, SOL F4
 - City: CH-8092 Zurich
 - Country: Switzerland
 - Email: bolligec@ethz.ch