SENSORY TRAITS IMPORTANCE DRIVEN BY THE BEEF CONSUMERS: PATHWAYS TO A 3G GLOBAL BEEF EATING QUALITY PREDICTIVE SYSTEM TO MEET CONSUMERS' EXPECTATIONS

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I. INTRODUCTION

The meat industry faces several challenges and predicting eating quality is one of them. Several commercial grading systems are used globally to trade beef, but only one is scientifically based on consumer expectations, the MSA grading system developed in Australia. In Europe, the actual commercial grading system for carcass conformation and fat distribution EUROP doesn't align with consumer's meal experiences. This was proven over the past 15 years with meat eating quality research trials using untrained consumers across Europe [1]. Since 2017 the collaborative platform hosted by the International Meat Research 3G Foundation (IMR3GF) has compiled the consumer sensory data collected using UNECE Beef Eating Quality protocols. The IMR3GF was able to design a European predictive model based on consumer sensory responses across many countries and over 25,000 European consumers.

II. MATERIALS AND METHODS

The approach of using common standards for meat products and sensory evaluation ensures data compatibility and enables reliable consumer sensory estimates to be developed [2]. During the sensory evaluation, each consumer is served 7 samples and each sample is tested by a total of 10 consumers. The data used for this approach represents consumer answers conducted in total on 11 muscles over the last decades in European countries (Poland, France, England, Northern Ireland, Wales, Ireland). Each consumer rated the 4 different variables, tenderness, juiciness, flavour and overall liking on a 100-line scale after eating each sample, 0 representing dislike and 100 like for each variable. The ethical standards were accepted to conduct the sensory sessions with untrained consumers. The potential hypothesis is whether a cultural effect would be observed amongst the consumers from different countries regarding beef preference.

III. RESULTS AND DISCUSSION

The cooking method grill is used in this study under the same conditions and doneness preference as medium rare in all countries except France with rare doneness. The scores given by the consumers for each variable (tenderness, juiciness, flavour, overall liking) were analysed and the weightings for each variable are represented Table 1.

Table 1 – Weightings by country

ConsCountry	Count	Tenderness	Juiciness	Flavour	Overall Liking
FRANCE	10,478	0.331	0.10	0.332	0.327
IRELAND	4,969	0.259	0.096	0.378	0.268
N. IRELAND	34,722	0.25	0.083	0.342	0.325
POLAND	42,397	0.237	0.057	0.397	0.308
WAL & ENG	10,907	0.312	0.104	0.288	0.295
N=	103,473	0.278	0.088	0.347	0.305

The weightings for each variable were determined including the 4 variables (SQ4). We observed a similar trend within the countries with consumer giving less importance to juiciness and more to beef flavour and tenderness.

As observed Table 1, the variable weightings slightly differ by countries, but the average remains the same. The equation used to deliver an accurate eating quality predictive score is 0.3tn+0.1ju+0.3fl+0.3ov for all the European consumers.

IV. CONCLUSION

The cultural differences were not driving the weightings on these experiments with untrained beef consumers. However, the flavour and tenderness variables were stronger and currently sought by beef consumers. These data have enabled the Foundation to develop a European predictive model based on research trials. The database contains data connecting cattle, carcase treatments, cuts and cooking styles to consumer answers on eating quality. The predictive model is an evolutive tool with further eating quality accuracy and scope developed with greater data. As all industry revenue directly relates to the consumers judgement of value, with the most critical component meal satisfaction, industry profitability can be enhanced by delivering consistent eating quality through strong commercial brands built on a solid scientific foundation.

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