

Economic Commission for Europe
Steering Committee on Trade Capacity and Standards
Working Party on Agricultural Quality Standards
Specialized Section on Standardization of Meat
Twenty-ninth session
Geneva, 6 - 8 September 2021
Item 3 of the provisional agenda
Eating quality

EATING QUALITY

The following document was received from the delegation of Australia for discussion:

The International Meat Research 3G Foundation (IMR3GF) has made significant progress since the last meeting despite the frustrations of managing COVID related difficulties of accessing slaughterhouses. Key activities have included:

1. DATABank.

The development of the DATAbank software is a major undertaking with development continuing under contract with EC&V who are highly experienced in technical system programming and Cloud based systems. The basis for the DATAbank is that it will house data that is generated using UNECE protocols for multiple members who each retain full ownership and control of their own data. The principle benefits of this approach are that the overhead cost and effort to maintain data in consistent format is more efficiently managed in a single structure with the considerable added advantage that data can be readily combined where agreed for joint analysis, including for development of eating quality prediction, consumer or animal related research analysis.

The data are now assigned on the basis of source files into the following categories:

1. Live animal data supplied from farm/feedlot. (Applies to all samples)
2. Slaughter floor data from abattoir files and mostly applies to all samples (Knock time, carcass weight, Sex, stun system and slaughter floor electrical inputs plus dentition where applicable and other country specific items) but may differ across samples due to different side treatments including Hang.
3. Grading data (marbling, ossification, hump height, rib-fat, meat colour from 3G/USDA/MSA or equivalent file). The core grade data will include ultimate pH detail taken at grading but not additional pH data – see Group 6. Additional grading inputs for various country or company carcass classifications/grades to accommodate USDA, JMGA, EUROP, SAMMIC etc. Currently known additional grading inputs will apply to the entire carcass, all cuts and samples as the carcass receives a single Grade, or in some cases a Quality Grade and a Yield Grade.
4. Primal cut and sample data including all ID linkages (most automatic from Experimental Design files but to include cook type, packaging and “value adding” treatments). Ageing and packaging protocols to be integrated and defined.
5. Consumer sensory data including allocation to sensory sessions, preparation pre cooking, event details and final data.
6. Individual cut pH data which includes the existing pH and temperature decline (taken on the LD muscle and received in a separate file from the graders in addition to the grade data). Other readings will include muscle pHU proposed to come from the CutUpFile in the ED and any decline data recorded from other cuts.
7. Specialised (all related to previous data categories but used less frequently and specialised-not included in model inputs at present).
 - a. Genomics
 - b. Flavour Chemistry
 - c. Laboratory
 - d. Other

The system is housed in an AWS Cloud environment and where possible utilises AWS code for core functions and security. The protocols for adding members, controlling access at multiple levels from administrator to restricted levels of data access, establishing sharing permissions for data pooling, adding or removing permissions is now completed with initial testing successful.

A further objective of the IMR3GF is to provide free access to software routines that assist in trial design and ensure unique ID and balanced design to produce consistent high quality data. The Experimental Design (ED) software component is currently at test phase having undergone extensive development. An ED is assigned for an experiment and developed from a

number of head to individual animal based sub groups with up to 6 side based treatment comparisons assigned followed by allocation to quarters (British/USA/Aust 10 – 12th rib or EU/South America Pistola) or other sub carcass sections such as Saddle or legs for lamb, which can also have multiple experimental treatments, to UNECE Item Numbers. Selection at any level accesses lists of component UNECE Items (cuts), muscles within Item and positions within muscles.

The final selection at any level determines the number of samples that are included in the design and their linkage back to animal and group. Provision is then made to assign combinations in priority order of cooking method, treatments, packaging types, ageing periods and destination(s) across each unit (muscle/cut/etc) using an extended Latin Square process to as near as possible balance all treatments across sides and cut positions.

Further routines are specified to select samples for consumer or objective testing, produce associated files and lists including labels for sensory questionnaires and plates, tailored to alternative paper and label stock sizes, and for checking of recorded sensory data and amalgamation with the other data. Protocols to range and error check all data inputs are planned.

The development work is highlighting areas that require further definition and relating to the IMR3GF Ontology technical group led by Jean-Francois Hocquette. The DATAbank source language is English but to be translated to initially French and Polish for data input and output to facilitate local language and terms for field use.

Legal data sharing agreements have been drafted and circulated to members in preparation for loading existing data. This will create a combined database of animal and consumer sensory data collected over a 25 year period in 11 countries.

2. DATA COLLECTION

The Foundation has been interacting with research and commercial entities wishing to categorise various cattle populations in regards to the predicted eating quality range of various cuts within desired populations, mostly related to existing or proposed brands. As COVID restrictions have allowed IMR3GF accredited graders have collaborated with groups in Ireland, France, Wales, Poland, Italy and USA. Extensive discussions have also been conducted with a South African group.

3. PROJECT SUPPORT

The IMR3GF is a partner in the large INTAQT European project and will record carcass grading data across 5 partner countries in conjunction with other partners who will take NIR readings. Consumer sensory samples will be fabricated from a sub set of cattle at each location with the Foundation responsible for overseeing consumer testing to UNECE protocol with samples also tested in multiple locations. The data will be processed through an IMR3GF 3G prediction model for INTAQT.

As part of the INTAQT project the IMR3GF will also conduct a chiller assessment training course in Spain, scheduled for November 2021.

The IMR3GF is also providing grading, cut collection and consumer testing in Ireland for an international genomics project which is evaluating genomic markers and eating quality relationships utilising 9,000 cattle over 3 years. The project is a collaboration between USDA, ICBF and MLA and encompasses a comprehensive range of production systems and both purebred and crossbred cattle including beef and dairy.

4. COMMERCIAL GRADING

The Foundation is developing a structure to enable commercial cuts based eating quality grading. A commercial grading prediction model(s) will be developed utilising authorised member data and housed in the Cloud structure. Accredited graders will be able to collect grading input data within factories and have it run through the model via internet connection instantly returning grade output related to company specified grade