Assessment of the Australian system for the prediction of beef quality (MSA): Which perspectives for the French beef sector? (and in Europe?)

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Meat Standards Australia (MSA)

* MSA is a product grading scheme focused on satisfying the consumer
* 4 quality levels assessed by consumers

Not good (not certified) MSA 3 MSA 4 MSA 5
The MSA prediction model for cuts

MSA moved from a carcass pathways to a cuts based grading scheme

Reasons
- Improved accuracy for the consumer
- Need to grade a greater proportion of the carcass

Consumer tests
- > 530,000 samples
- 40 muscles
- 6 cooking methods

Construction of the MSA system

1- Setup of a database

Data characterizing animals and sampled meats

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<th>Tenderness</th>
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<th>Overall liking</th>
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MSA 4
- Unsatisfactory
- Good everyday
- Better than everyday
- Premium
Construction of the MSA system

2 - Use of the database

- MQ4 score development
- Identification of the factors which explain the MQ4 level
- Development of a model to predict the MQ4 score

Consumer tests

Data characterizing animals and sampled meats

MQ4 Score

0 46 64 76 100

Muscle × Cooking method

Meat Standards Australia

- **Predictors**
  - Breed (2-10) restricted to Bos indicus content
  - Gender (2)
  - Growth path (10)
    - carcass wt
    - ossification score
    - Milk fed veal
  - Hanging (0-10)
  - Marble score (2-10)
  - Ageing: 5d min (0-6)
  - Cooking method (0-12)
  - Muscle (30)
  - pHu
  - Rib fat

- **Basic criteria**
  - Stress minimization
  - Optimal processing

- **Thresholds (requirement)**
  - Ossification score (<300*)
  - Ultimate pH<5.7/colour
  - Rib fat > 3mm
### Inputs

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### Cooking Method

- **Inputs**
- **MQ4 score**
- **Cuts**

### Marbling

#### MSA2000model®

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### Palatability grade
Marbling

Criteria adapted to the Australian context

Predictors of palatability

% Bos Indicus

Hormonal growth promoters implants

Sale yard

Ossification index OSS

Indicator of physiological maturity

Influence of age on the sensory qualities of the meat: YES in France

Because modifications of the intrinsic characteristics of the muscle

40% of Australian herd

No interest for France
**Predictors of palatability**

**Thresholds (exclusion)**

- **Thickness of subcutaneous fat** < 3 mm  
  Equivalent to fatness
- **ultimate pH** > 5.7
- **Colour** > 4 (Scale from 0 to 7)  
  Associated to meat with a high pH
- **Ossification index** > 300  
  (Scale from 100 to 600)  
  Which means age > 42 months
  
  No young bulls, steers and heifers only (cull cows excluded)

- Initially not adapted to France
- Now, more adapted to France and interest to bring bulls

**Predictors of palatability**

... **Other criteria before slaughtering**

- **Sex**  
  Steers > heifers  
  + 2 MQ4 units  
  
- **Growth rate**  
  Positive impact on MQ4

**MSA Recommendation:**

ADG from 0.5 to 1.5 kg/d during 30 days before slaughtering is required.  
Finishing in feedlot is recommended.

**Relation “Average Daily Gain” and tenderness: YES in France**

The French studies concerning the influence of growth rate confirm its benefit effect on sensory qualities of meat.
Predictors of palatability

... Other criteria after slaughtering

Marbling
- Positive impact on MQ4
- Not well adapted to France
- But interest to include intramuscular fat

Ageing time
- Requirement of MSA: minimum 5 days, up to 42 days
- French recommendation > 7 days

Hanging of carcasses
- Achilles hang and tenderstretched
- Tenderstretching improves the eating quality of many cuts in the hindquarter

Interaction Muscle × Cooking method × Time of ageing

Confirmed in France

Opinion of French experts in Meat Science

- MSA is a scientific, rigorous and coherent approach
- MSA is based on true observations, not pre-established ideas nor traditional and subjective ideas
- MSA is innovator, because based on the consumer and on cuts
- MSA is relevant, and based on segmentation by the quality
- MSA is credible (authorities, consumers)
- MSA is opened, does not lock into the Truth

System to be meditated!
Opinion of French experts in Meat Science

- A system not so used as his promoters sometimes would like to say it
- Sometimes diverted (serves as guarantee of supply carcass)
- In a country where did not nevertheless pre-exist multiple quality signs ...

A system with no future ?

or

A new system which is growing ?

In conclusions

A good system which may be used everywhere.

- Testing has been undertaken in Japan, Korean, Ireland, United States
- Interest from and for European countries

BUT

No extreme lean breeds tested in Australia (as pure breeds) and no bulls as in France.
Challenges (everywhere)

- Beef Industry conservative - takes time
- Need processors (abattoirs), retail and food service involved early
- They need individual engagement
- MSA was not popular when it competed with existing brands: Now used to underpin brands = MSA now often not visible to the consumer in Australia
- Still some of the most powerful tools are not being heavily used: Cuts - cuts grading still not being fully utilized