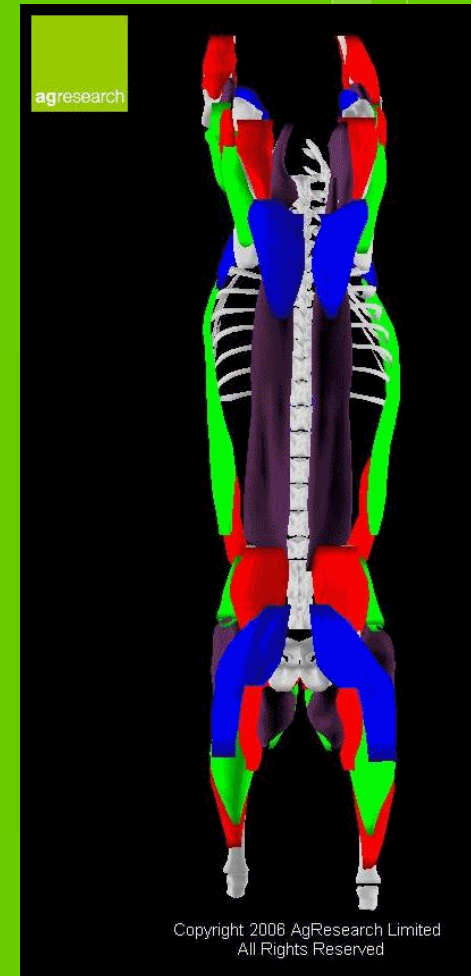


3D Anatomic Models for Lamb and Beef

Dr Qian Zou
Dairy Science



Farming, Food and Health. **First**

Te Ahuwhenua, Te Kai me te Whai Ora. Tuatahi

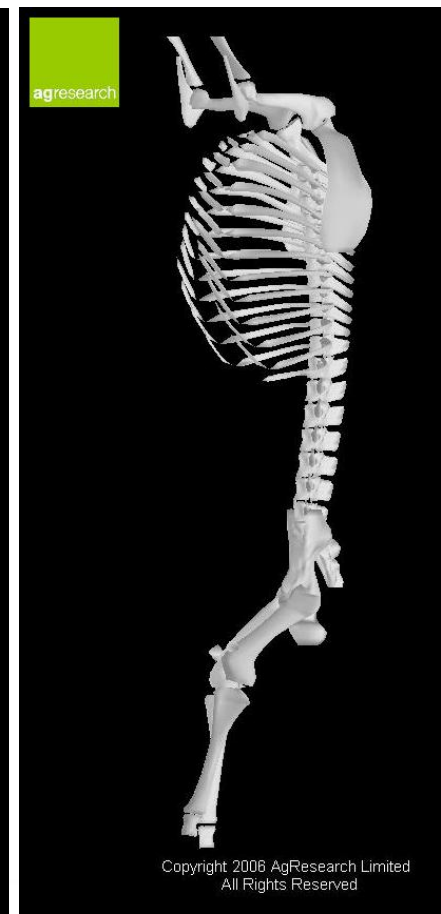
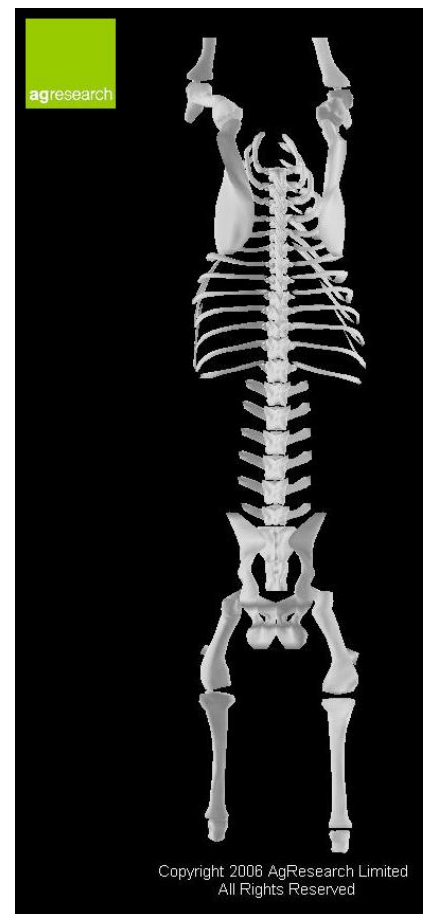
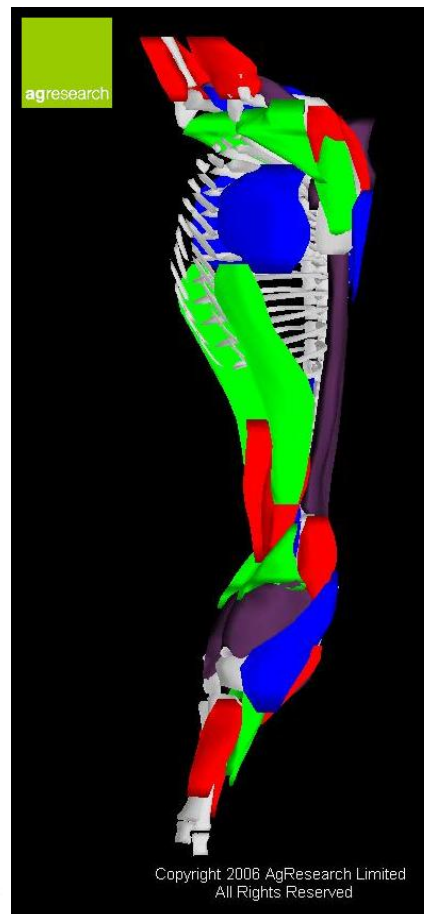
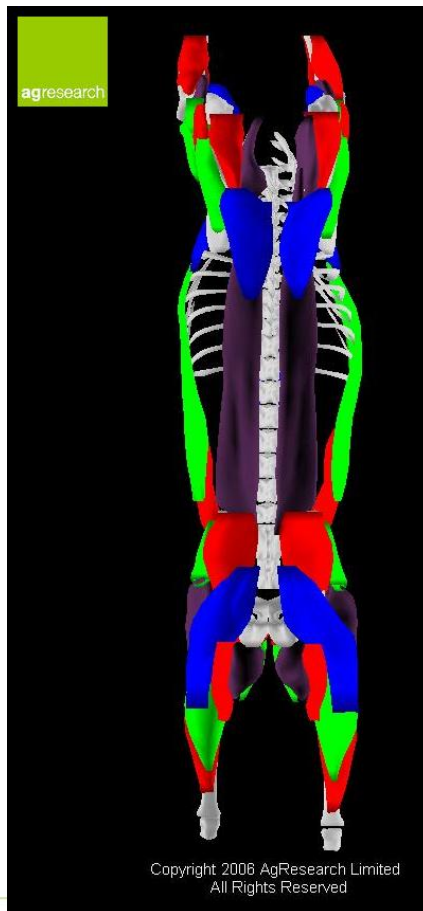
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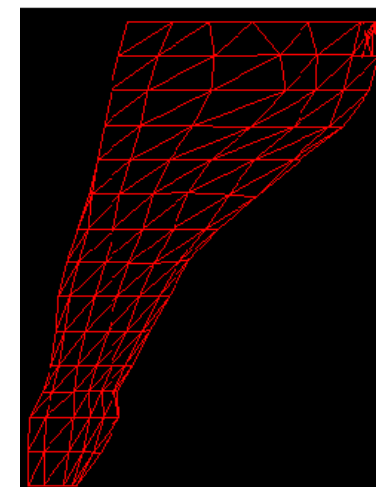
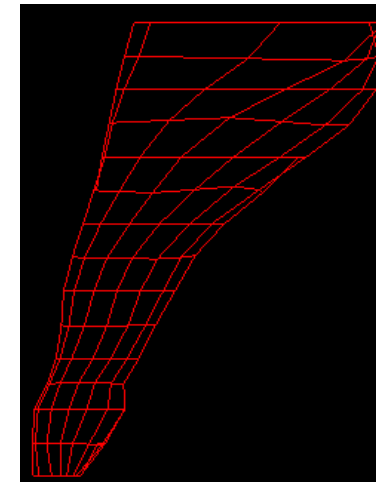
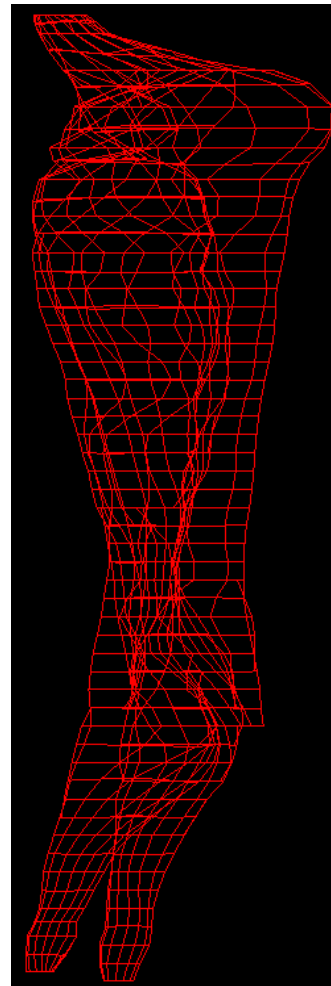
Anatomic models of lamb and beef

- Collection of muscles, bones, skins, etc.



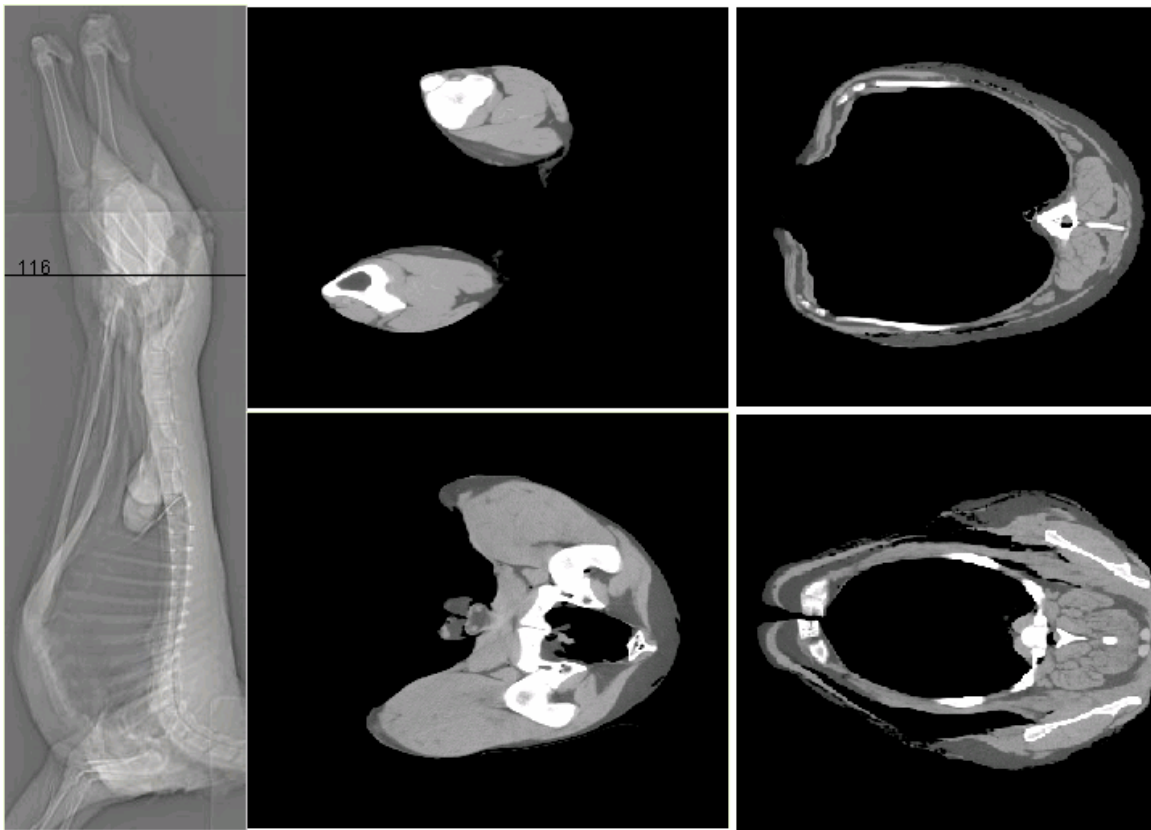
Anatomic models of lamb and beef

- Individual muscles, bones, and skins are described with
 - Composite parametric surfaces (Hermite, Bezier, B-Spline, etc.)
 - Collections of triangles
 -



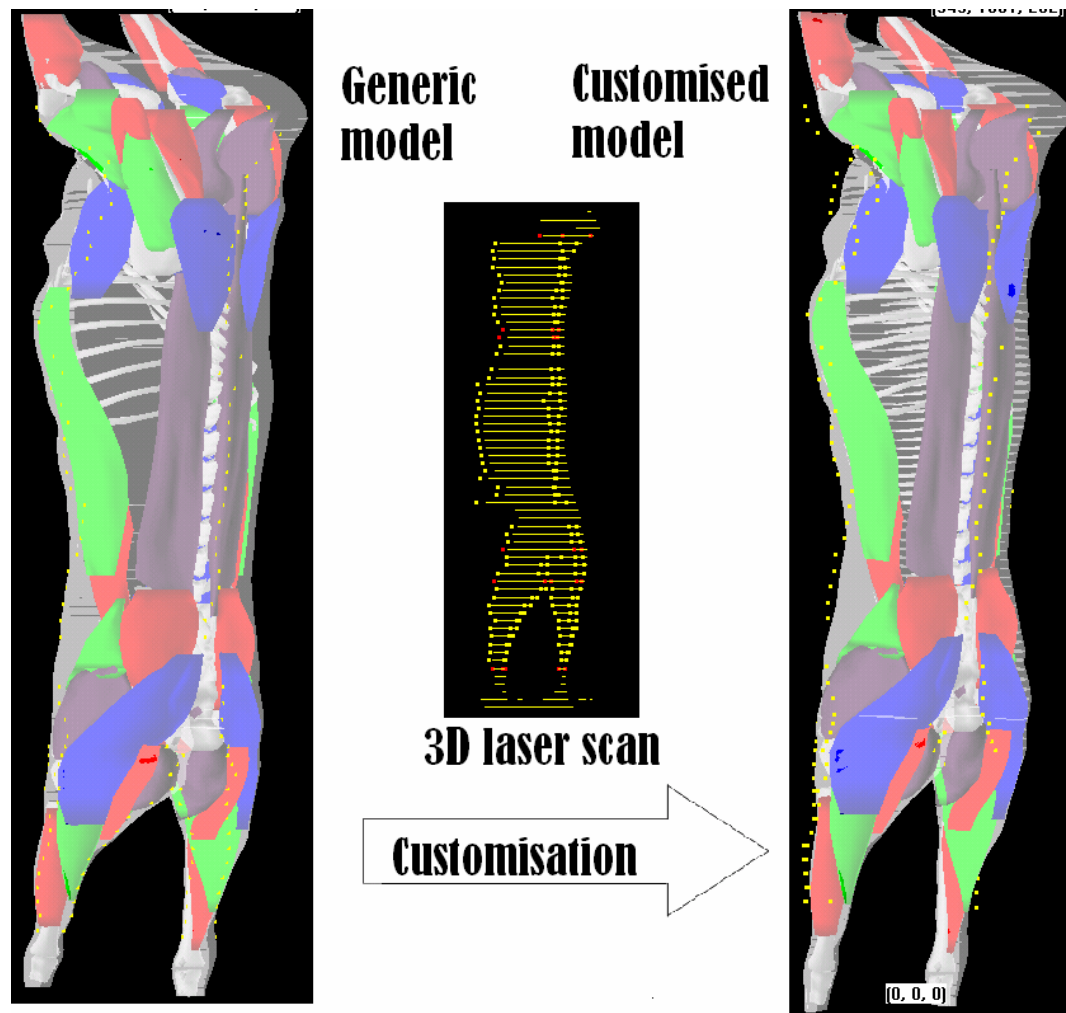
Creation of generic anatomic models

- Created from 3D CT scans – anatomically accurate



Creation of anatomic models for individual animal or carcass

- Customise the anatomic model according to the measurements from individual carcasses
- Customised model represents the anatomic structure of an individual carcass



Model customisation – advantages

- Large amount of information can be drawn from relatively small amount of measurements
- Obtain the attributes that are expensive, destructive, interruptive, or slow to be measured directly
- Many key measurements can be inferred from the same set of sensor data using the same model, without the need to develop separate correlations for each key measurement
- Sensor data can be interpreted for validity in the context of the model providing an implicit estimate of confidence in the measurement produced
- Missing data points can be interpolated using adjacent data points within the model based on anatomical structure



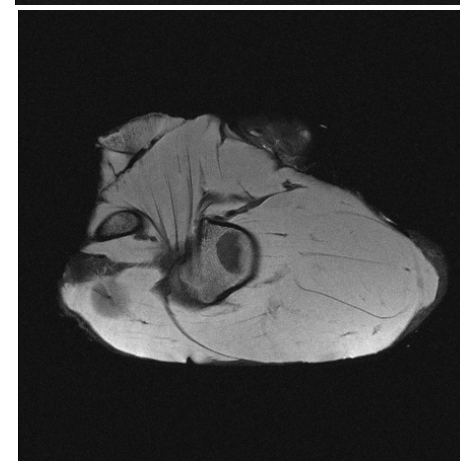
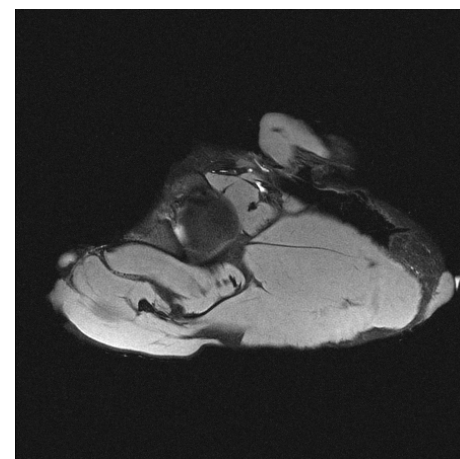
Measurements for model customisation

- Internal measurements

- CT
- MRI
- X-ray
- ...

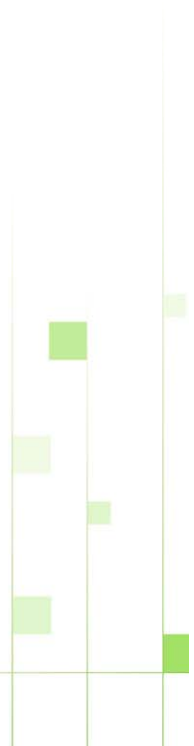
- External measurements

- 2D imaging
- 3D imaging
- Laser scan
-

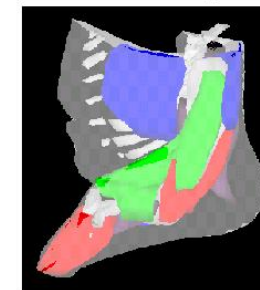
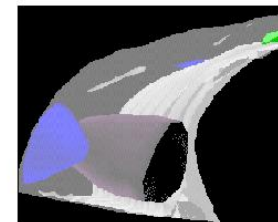
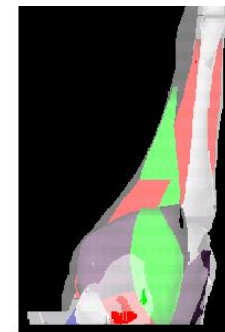
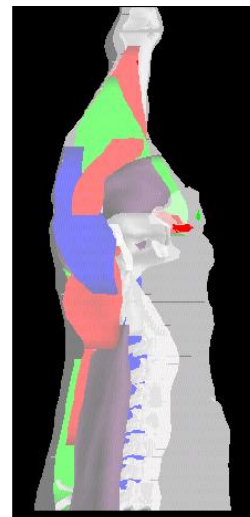
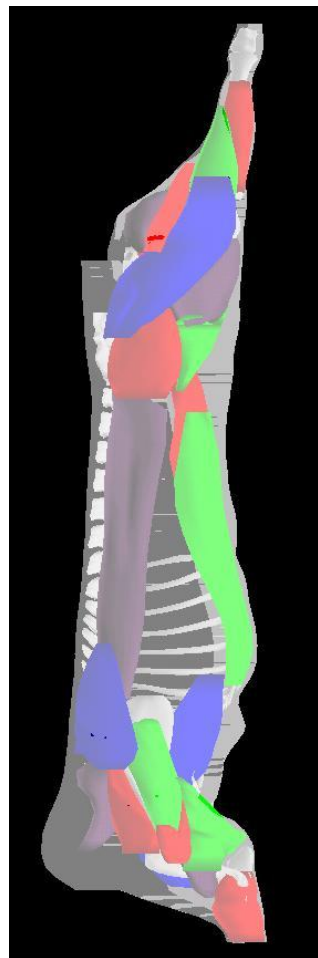


Model application – processing automation and optimisation

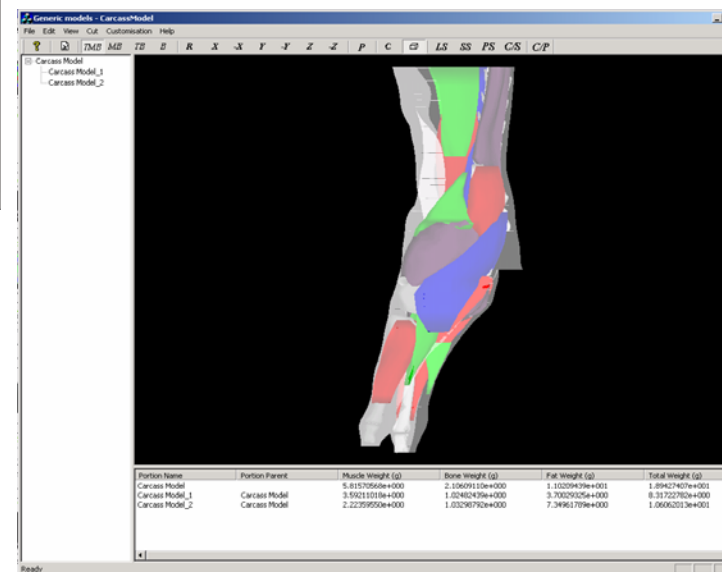
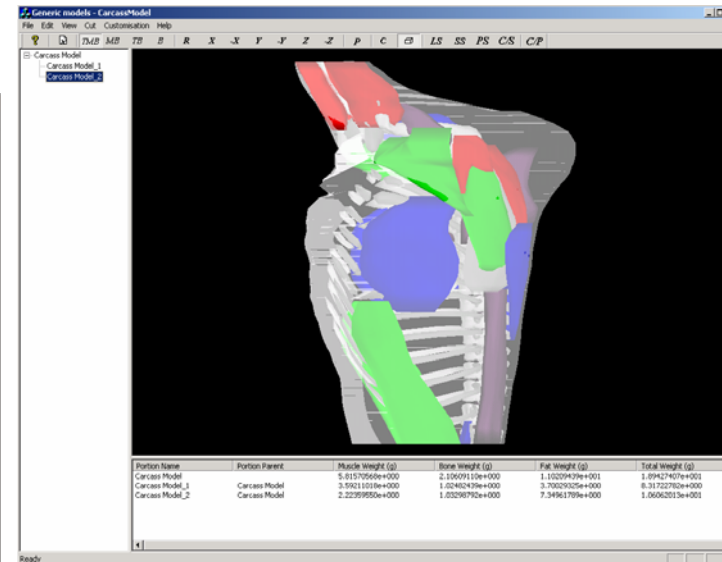
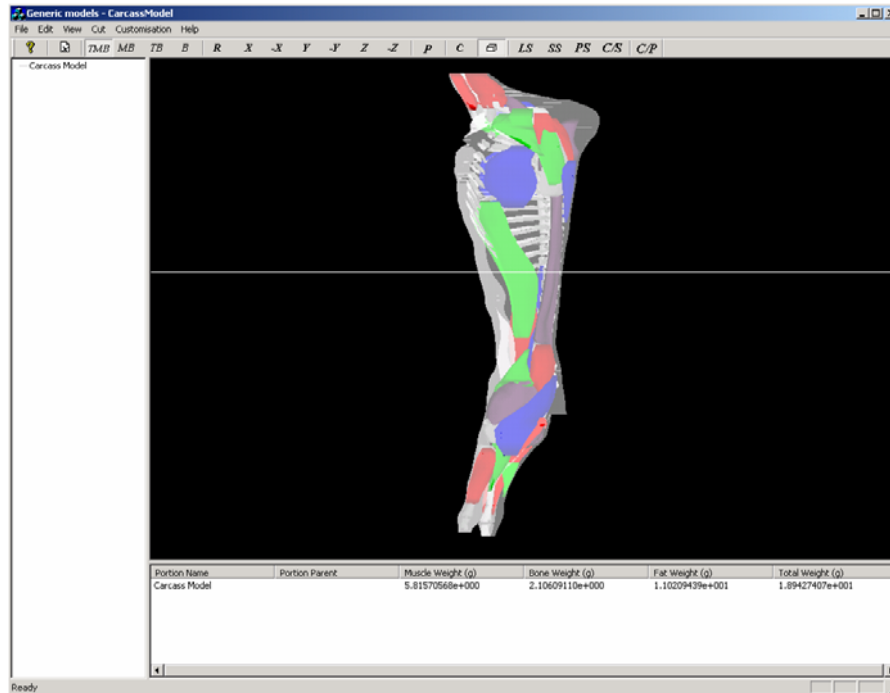
- Use cost-efficient, non-destructive, non-interruptive methods to obtain key dimensional measurements of individual carcasses
- Create the anatomic models for individual carcasses using the dimensional measurements
- Extract the data required for processing automation from the customised models
- Feed the data to cutting robots
- Based on the information extracted from the customised models, different cutting procedures may be used for different carcasses to maximise the return



Model application – simulation – cutting method development



Model application – simulation – training and marketing



Model applications

Your inputs and involvement

