

# Incorporating meat eating quality into commercial sheep breeding programmes

Undertaken in conjunction with a KESS-funded studentship  
and with support from Hybu Cig Cymru



## Previous research.....

Muscle density measured with CT

**Low** muscle density

associated with

**Higher** intramuscular fat

associated with

**Better** eating quality



# CAN MUSCLE DENSITY BE USED AS AN EFFECTIVE BREEDING TOOL TO ENHANCE MEAT EATING QUALITY?



## APPROACH

- Industry scale “high / low” trial
  - Establish range MD values across commercial population
  - Identify 5 HIGH and 5 LOW muscle density ram lambs
  - Use rams to sire progeny in single 230 ewe commercial flock
  - Slaughter lambs on commercial criteria
  - Test for MEQ attributes including trained taste panel and meat quality assessments
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## MUSCLE DENSITY MEASURED BY CT

120 Abermax rams

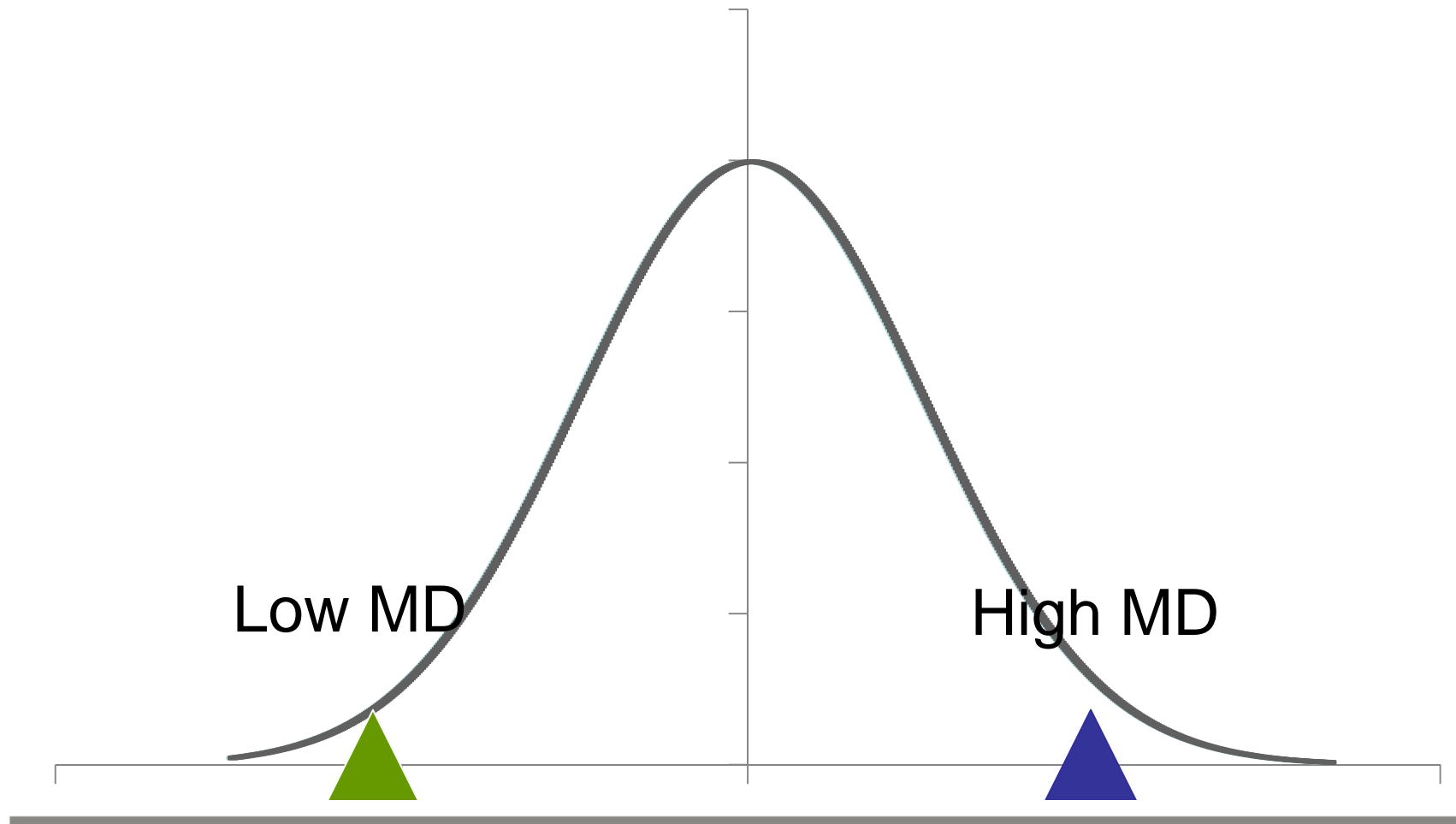


5 high/ 5 low MD  
ram lambs

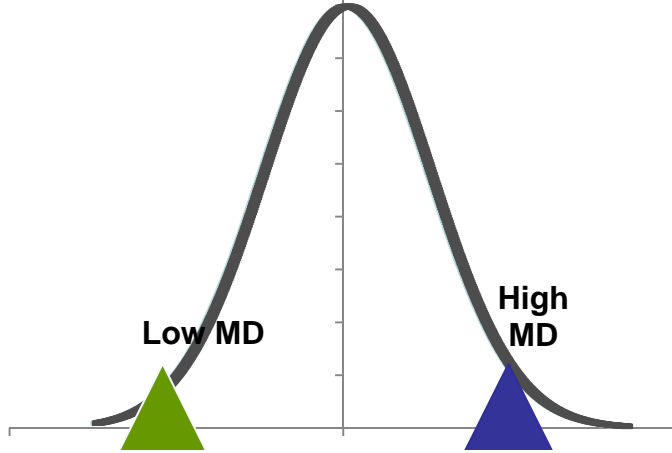


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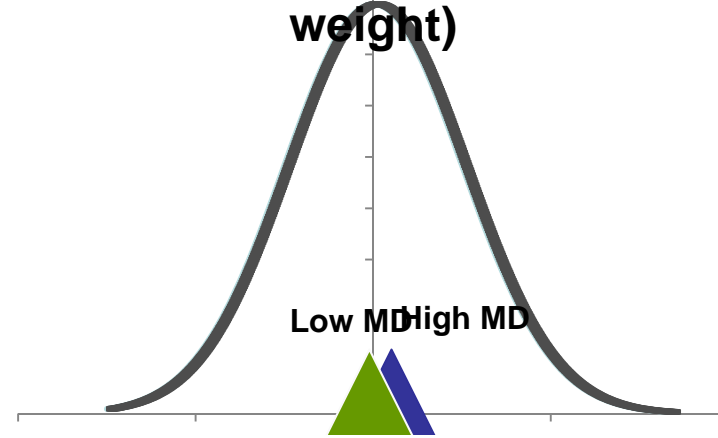
# Lambs selected on CT muscle density



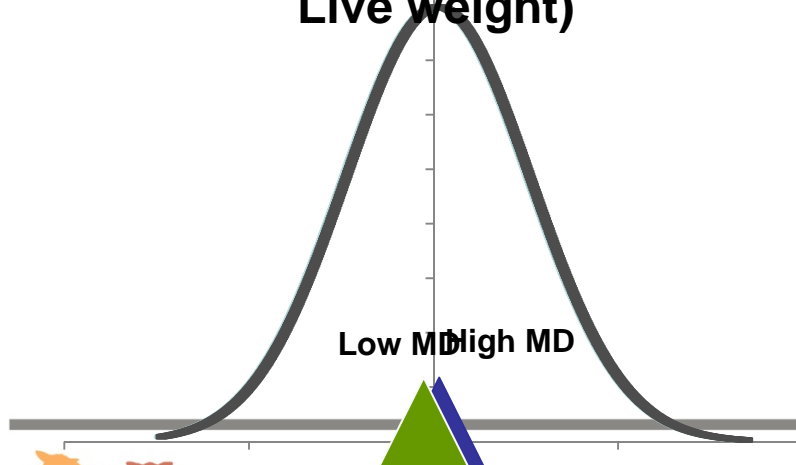
### Muscle Density (HU)



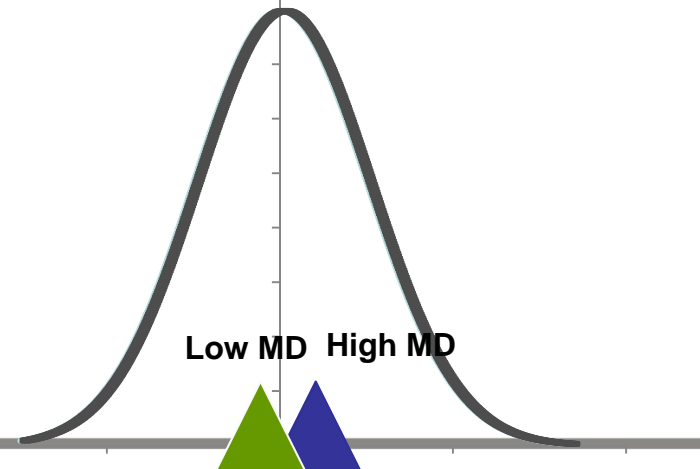
### Fat weight (adj. for Live weight)



### Muscle weight (adj. for Live weight)



### Live weight



## MATING PLAN AND PROGENY TESTING

Semen from 5 high/low MD ram lambs



AI 230 North Country Mules



87% conception rate  
405 lambs born, 340 @16wks





## GROWTH.....

- No difference in birth weight
- No significant differences in growth rates



## MEASUREMENTS AT SLAUGHTER

252 lambs – 4 balanced batches

No differences in ultrasonic muscle depth and fat depth at point of slaughter

- Graded / live weight
- Hot Carcase Weight
- pH at 3 hours/48 hours



## LIVE / CARCASS MEASUREMENTS

- Progeny of **high** MD sires significantly higher carcass weight and killing out %
- No difference in carcass fat grade
- Progeny of **high** MD sires had significantly better conformation grades
- No differences in the distribution of meat and waste



# MEAT EATING QUALITY ASSESSMENTS

Right Rear ½ loin  
SRUC - Shear Force



Whole Left Loin

Right Front ½ loin  
IBERS – Fatty acids  
Colour

Bristol - Sensory analysis  
trained taste panel



## KEY FINDINGS

Loins of progeny of low muscle density sires had loins that were:

- lower shear force (i.e slightly more tender)  
(not statistically significant)
- redder and more colour saturation  
(statistically significant)
- **consistently** rated more favourably by taste panel (not statistically significant)
- 8% more intramuscular fat (not statistically significant)



## CONCLUSIONS

The use of CT muscle density **may** offer a promising current and cost effective means of maintaining and improving eating quality.

Measures of CT muscle density should be used **alongside** measures of growth and muscling to improve overall carcass value.





Enjoy your lunch!

With thanks to:



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Knowledge Economy Skills Scholarships

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