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Ultrasound measurements of lamb loin muscle and back-fat depth in the Czech Republic

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INTRODUCTION

Sheep are bred mainly for heavy lamb (35-42 kg liveweight) production and play important role in landscape management in the Czech Republic .

Meat breeds, suitable for use in terminal sire position in hybridization programs, represents cca 40% of sheep population under recording.

Ultrasound technology has been routinely used in breeding programs for meat breeds of sheep since the year 1999.

Main goal of this work was to evaluate the impact of the first decade of ultrasound technique apply for in vivo prediction of carcass quality traits in the Czech Republic.

MATERIAL AND METHODS

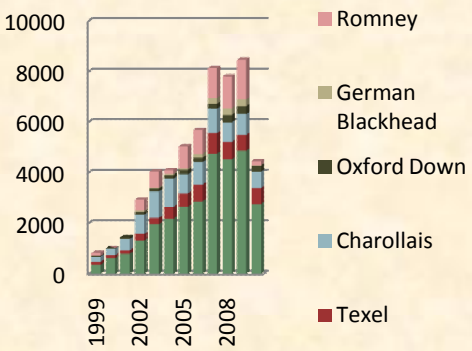
Totally 53 993 lambs of Suffolk, Texel, Charollais, German Blackhead, Oxford Down and Romney breeds were scanned at the age 100±20 days during the years 1999-2010.

Ultrasound measurements for backfat thickness (UFT) and longissimus dorsi muscle depth (UMD)were taken between 13th thoracic and 1st lumbar vertebrae.

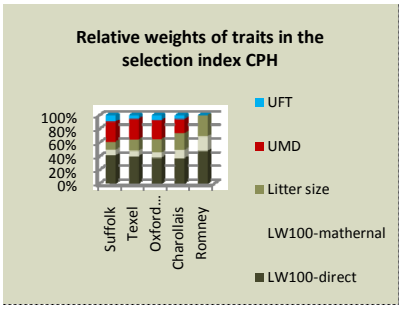
Real time scanners Aloka SSD500, WED2018, SonoVet2000 or Echo Blaster 128 equipped by linear probes working with the ultrasound frequency varied from 4,5 to 8 MHz and with width of field of view 5,6 – 6,2 cm were used.

Breeding values for UFT and UMD were estimated by BLUP Animal Model with the effects of heard and year, number of reared lambs in litter, age category of the dam, sex, age at scanning and live-weight at scanning , genetic effect of the animal and random error in model equation. The genetic trends were expressed as changes in averages of breeding values across birth years of animals.

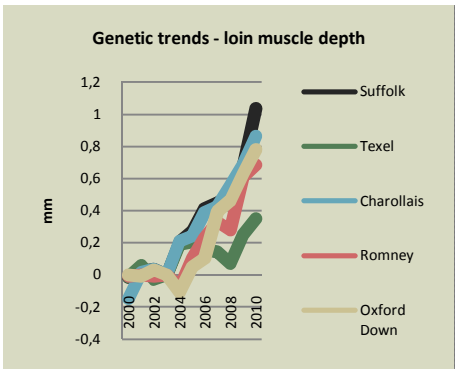
Numbers of lambs measured by ultrasound

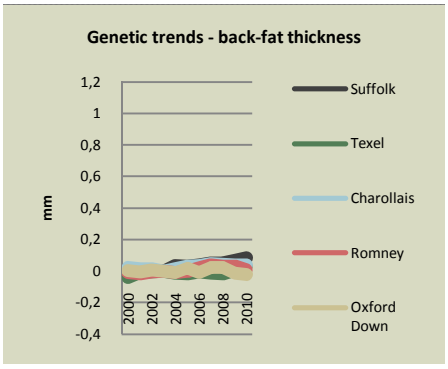


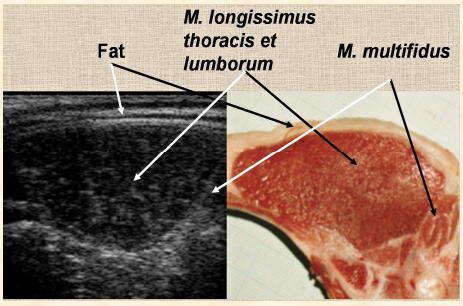
RESULTS



Explanatiopns: UFT – ultrasound backfat thickness, UMD – ultrasound loin muscle depth, LW100 - lamb liveweight at the age 100 days – direct and mathernal genetic effects







COMMENTS AND CONCLUSIONS

Relative importance of muscle depth measured by ultrasound (UMD) in selection indexes for meat breeds of sheep ranged between 16-27%.

Relatively small importance of back-fat thickness (UFT) in selection indexes (5-9%) is caused mainly by low back-fat thickness and small variability of that trait at the time of measurement (80-120 days of age). Nevertheless ultrasound technique enables to detect and to eliminate the animals with high back-fat thickness.

Positive genetic trends for UMD are notable from the year 2003, when estimations of BVs by BLUP Animal Model started. No genetic progress is visible for UFT.

The ultrasound technique is valuable tool for genetic improvement of lamb carcass meat:fat:bones ratio in meet sheep breeds in the Czech Republic.

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