How To Select for Higher Lean Yield?

Ultrasound scanning on lambs

In recent years, the meat market has undergone changes that require high standards of quality, so aspects like lean yield have become critical in meat production. Furthermore, some other countries flood our markets with their products. How can the Canadian sheep industry offer better products to consumers? Canadian sheep producers need to improve lean yield to become more profitable while meeting customer needs.

The best way to evaluate animal lean yield is by taking post-slaughter measurements on carcasses. Is it possible to evaluate this trait on live animals? Ultrasound scanning is the solution to measure muscle and fat depth to select future replacement stock.

Ultrasound scanning is done in many species to improve muscle depth while minimizing fat deposition. These measurements are integrated into most of the genetic programs all around the world. Ultrasound measurements are one more tool that can help you make decisions that will improve your lambs' performance. Market lambs with higher lean yield will make consumers more satisfied with Canadian cuts of lamb.

Advantages of ultrasound measurements

The main purpose of taking ultrasound measurements is to select animals with more muscle and less fat. Selecting only on growth rate will result in animals with better performance, because there is a favorable correlation (genetic link) between growth and muscle deposition. This means animal with better growth tend to also develop more muscle. However, the genetic gain is much faster for muscle depth when using ultrasound measurements. Also, the relationship between growth rate and fat deposition is unfavorable. This means

by selecting only on growth rate, animals get fatter. Selection based on growth rate isn't optimal in providing a higher carcass quality to the market. Pressure to increase slaughter weights can also result in fatter lambs. This can be counteracted with genetic selection for carcass quality traits.

Fortunately, loin eye and fat depth have high heritabilities. This means these traits can be improved quickly by doing good genetic selection on the sires and the dams. Traits with

high heritability are passed easily from parents to offspring, so muscle deposition and fat depth can be quickly improved to produce higher quality market lambs. Furthermore, a ram needs only a few progeny with ultrasound records to get precise breeding values for carcass traits. This helps in quickly identifying families with better genetic merit to improve carcass quality.

How it works?

An accredited technician measures all the lambs in a management group. The measurements must be taken by an accredited technician as the ultrasound site and procedure need to be standardised to be included in breeding values. The ultrasound measurements themselves have no value if your performance data

(birthdate, sex, litter size, weights, etc.) and pedigree are not recorded. GenOvis evaluates the difference in performance between the lambs raised in the same environment. All the lambs within a management group should be measured to obtain accurate breeding values. Scanning only your top lambs or those
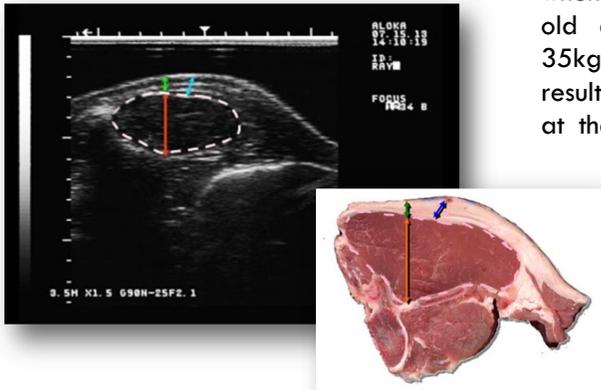
you selected as breeding stock reduces the accuracies of the breeding values in the genetic program. These lambs will be compared together and there will

be missing information about poor performing lambs within the group required to make a better global evaluation. The lambs are scanned when they are around 100 days old and weigh an average of 35kg. Scanning lambs too young results in a missing growth period at the end and does not provide enough difference in muscle and fat deposition between lambs. Records

are then too similar, and the genetic program is less efficient in determining which lambs have the better potential to produce leaner and more muscular progeny.

Finally, the muscle and fat measurements are recorded in the genetic program for breeding value calculations.

Left: ultrasound picture with loin and 2 fat measurements
Right: picture of a real lamb chop with loin and 2 fat measurements

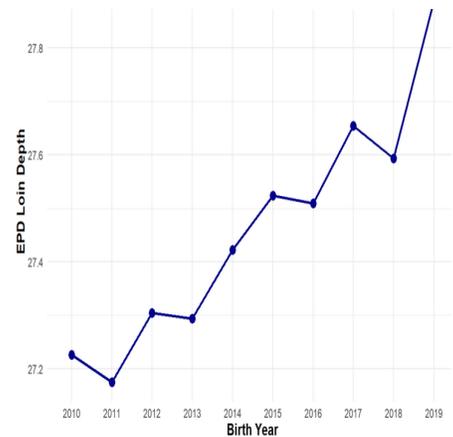## What to expect from genetic selection based on carcass traits in terminal breeds?

GenOvis has designed a genetic selection index for terminal breeds for optimum multiple trait improvement that includes carcass traits (65% on growth traits and 35% on carcass traits). The CARCASS index (CARC) is used to select animals that have more muscling, less fat and that grow faster, while limiting the increase in birth weight and improving the pre-weaning survival rate. Increasing just growth will result in heavier lambs at lambing that can create lambing problems. The CARC index includes the birth weight EPD to limit birth weight increases.

The genetic trends below represent loin depth (muscle) improvement over the
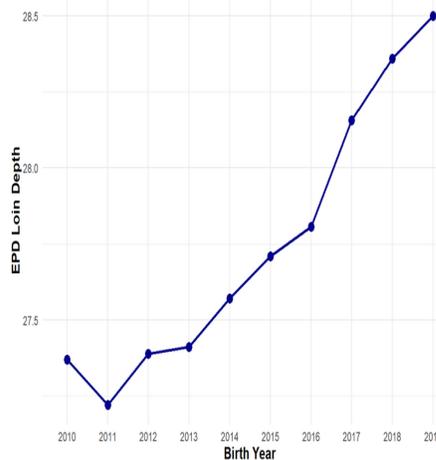
past 10 years. They show that selection based on the CARCASS index will improve the muscle depth in different breeds.

Some breeds can improve loin depth by 0.2 mm each year. This is a good genetic progress!
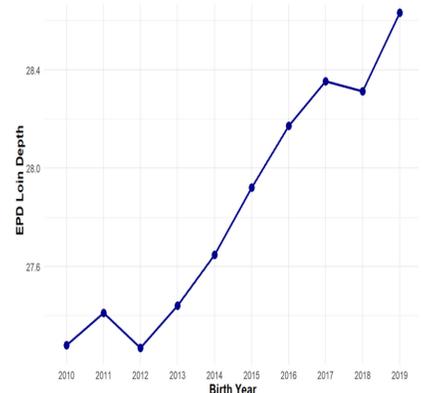
Genetic trends for loin eye depth (muscle) - Hampshire

Genetic trends for loin eye depth (muscle) - Canadian Arcott

Genetic trends for loin eye depth (muscle) - Suffolk

Conclusion

Ultrasound is a very nice tool sheep breeders can use to improve lean yield in terminal breeds. Are ultrasounds useful in maternal breeds? Read more on other articles available on our website.

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