

Benefits of VIAscan[®] to producers and WAMMCO

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ABSTRACT

VIAscan[®] is an objective grading tool that utilises Video Image Analysis (VIA) technology to quickly and accurately assess lamb and beef carcass characteristics.

INTRODUCTION

The VIAscan[®] Sheep Carcass System was developed by Systems Intellect Pty Ltd and VQA Australasia as part of the Australian Meat Research Corporation's Objective Carcass Measurement Program (1) and has subsequently been sold to and is now marketed by SASTEK Pty Ltd. The VIAscan[®] Sheep Carcass System uses video image analysis to objectively predict the lean meat yield (weight of lean tissue presented as percentage of the carcass weight) of lamb carcasses on the chain at slaughter speed in abattoirs.

REVIEW

Financial assistance via a WA Government Centre of Excellence Award in recognition of the contributions of Murdoch University, Department of Agriculture WA and CSIRO to the Australian Sheep Industry Cooperative Research Centre, has led to a VIAscan[®] sheep carcass system and a Dual Energy X-ray Absorptiometry system being purchased for use in WA. The VIAscan[®] system has been installed at WAMMCO, Katanning.

The VIAscan[®] Sheep Carcass System consists of a booth, artificial light, a high quality digital camera and a computer program that analyses the images and extracts carcass measurements (2). As the carcass enters the booth, the gambrel triggers a switch and an image is taken. Before the image is analysed, the computer calibrates itself against a series of different coloured tiles surrounding the image. The computer traces the outer edge of the carcass, measures the surface colour at 6 selected positions (2 x chump, 2 x loin and 2 x shoulder regions (3)), makes a series of maximum and minimum measurements along the whole carcass, works out the groin angle (indication of confirmation) and makes 186 dimensional measurements before it predicts the lean meat yield of the carcass.

The Australian VIAscan sheep carcass system uses algorithms to predict lean meat yield based on a study of 360 lamb (Merino, first and second cross) carcasses. Images of the carcasses were taken to allow dimensional and colour measurements before the carcasses were dissected to lean, fat and bone. The accuracy of the algorithms is based on residual standard deviation (a means of describing the error around a prediction equation) and 67% of the time the VIAscan[®] system will predict yields to be within $\pm 2\%$ of the actual yield and 96% of the time within $\pm 4\%$ of the actual yield which is significantly more accurate than other forms on-line of carcass measurement.

Producers

VIAscan[®] has the potential to benefit producers by providing increased feedback on their carcasses and in time, will reward the producers, when payment options are established for carcasses with higher lean meat yields. Producers must understand the variation in percentage carcass lean meat yield is largely a function of fat depth. If you are producing trade weight lambs (18 - 22 kg), 15 - 20% of the carcass weight is fat. However, the percentage of fat of heavy export lambs (26 - 30 kg) can be higher than 30% (Tom Bull *pers comm.*). The key is to understand LAMBPLAN Estimated Breeding Values (EBVs). Best results are obtained when rams have been carefully selected to match your ewe base and to meet your target carcass weight. Selecting sires with a high growth EBV (+ve Post weaning weight), well muscled EBV (+ve Post weaning eye muscle depth) and lean EBV (-ve Post weaning fat) will produce fast growing, lean, well muscled lambs with a high lean meat yield.

Processors

The installation of VIAscan[®] into a processing facility provides improved production efficiencies. When fully calibrated, the VIAscan[®] system removes human error and the need for subjective grading and allows the carcasses to be sorted and delivered into chillers in homogeneous lines to better meet customer specifications. It will identify the highest yielding carcasses that can be selected for further processing to meet the needs of the highest paying markets. As variation in lean meat yield between carcasses is vitally important in determining the efficiency of a processing operation, the increased

feedback to producers should improve their knowledge base. The subsequent carcasses produced should vary less in yield, require less processing and hence improve the rate of throughput (4).

WAMMCO is in the process of validating the VIAscan[®] system through a series of boneout trials to compare the actual versus predicted lean meat yield of crossbred lambs. Although the sample size is small, at this stage VIAscan[®] is over predicting the lean meat yield. WAMMCO and SASTEK together with industry partners are investigating broadening the types of lambs upon which the Australian yield predictions algorithms are based. A higher proportion of second cross lambs of lighter carcass weight (15 – 18.5 kg) has led a large New Zealand processor to spend the last 3 seasons boning out and measuring carcasses to form algorithms that will accurately predict New Zealand style carcasses (Murray Behrent *pers comm.*). The processor intends to start paying producers on lean meat yield from the beginning of the 2005/6 season (5).

Responsibilities to the prime lamb industry

It is known that the degree of subcutaneous and intramuscular fat in the carcass influences lean meat yield and so, the primary method of increasing lean meat yield is to drastically reduce the overall carcass fatness or increase total muscle. Either approach will lead to reduced intramuscular fat content and so potentially reduced cooking and eating quality characteristics. Further negative effects of very lean carcasses could be an increase in the likelihood of very rapid chilling and so the cold shortening of product. Given this, minimum fat characteristics are currently being determined to guard against possible negative effects of leanness. In addition, electrical stimulation and chiller management is being used to prevent cold shortening.

Payment systems based on carcass lean meat yields must be carefully designed so they don't have a negative impact on the prime lamb industry. For example, increasing the size of shoulders can improve carcass lean meat yield. However, breeding for larger shoulders can lead to birthing problems on farm and producing a carcass with more meat in some of the lower valued markets.

CONCLUSION

VIAscan[®] offers the meat industry an objective grading tool, capable of replacing manual meat grading and providing a better estimate of carcass characteristics and value than obtained simply using carcass weight and fat score alone.

KEY WORDS

VIAscan[®], lean meat yield

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