Ultrasound Reports – What Does My Information Mean?

Carcass characteristics are moderately to highly heritable. This means that a lot of the differences between animals are due to genetic influence. Ultrasound is highly indicative of these differences in relative carcass merit. Table 1 shows the strong relationship between carcass and ultrasound traits in the Hereford breed.

It is vital to realize that scanned animals will not exhibit the same characteristics as slaughter animals. For example, fat thickness and intramuscular fat will tend to be lower on animals fed a development ration, than those fed a finishing ration. The most important aspect to focus on with your reports is the differences between animals, as these differences are passed on to progeny.

Table 1. Relationship of Hereford seedstock ultrasound and harvest progeny carcass charactersitics

	CRIB	CREA	CIMF
URIB	**0.87**	-0.09	0.38
UREA	-0.15	**0.93**	0.02
UIMF	0.65	-0.16	**0.82**

The Report

Raw data (measured values) are reported for all cattle that had a successful image recorded. These actual measurements such as rib-eye area, fat or intramuscular fat do not tell us much useful information. Animals between 300 and 530 days of age will receive age adjusted values for Rib-Eye Area, Fat Thickness and Intramuscular Fat.

1. Rib Fat
Adj. Fat = Obs. Fat + (365 - age) * 0.000493
2. Rib Eye Area
Adj. REA = Obs. REA + (365 - age) * 0.01493
3. IMF
Adj. IMF = Obs. IMF + (365 - age) * 0.00205

Animals are grouped based on their sex, scan date and the breeder's indicated scan management group. As well, animals that were grouped separately at weaning are kept separate. This helps to remove differences caused by the environment in the expression of scan characteristics. Animals in groups that contain more than one animal then receive an index value based on their adjusted data. These are calculated in exactly the same way that weight indexes are calculated.

Index = Age Adjusted Value / Group Average Age Adjusted Value x 100.

Although not as powerful as an EPD, these index values are useful for within herd selection as only those animals that have had the same environment are directly compared with each other.

How does my ultrasound data contribute to EPDs?

All ultrasound scan records are submitted to the genetic evaluation. Records are first edited for eligibility. This means that records must be within the age limits, animals must be in valid groups (more than two animals) and that all other information must be correct. The information is then incorporated into a multi-trait model that includes ultrasound, carcass and growth information and uses the relationships between these traits to provide a state of the art assessment of relative carcass merit.

Table 2. Breed Average Carcass EPD

	REA (in^2)	Fat (in)	IMF (%)
Sires	0.12	0.003	0.00
Dams	0.06	0.001	-0.01
Calves	0.13	0.003	0.00

(over)

What to Select For

Generally carcass values are determined by a combination of yield and quality grade (marbling) within a target carcass weight range. Yield is determined by Rib-Eye Area and Fat Thickness. As rib-eye increases, lean yield also increases. As fat increases, lean yield decreases.

Marbling is indicated by Intramuscular Fat levels. Table 3 shows how IMF scores translate into Canadian quality grades. It is important to remember, that most seedstock cattle on a development ration will not express extremely high levels of IMF.

Depending on the animal's role, producers will generally want to put some emphasis on increasing Rib-Eye size and IMF levels. Additionally, producers will want to think about maintaining or reducing fat levels, depending on the type of animals being mated and the role of the resulting offspring.

Table 3. Equivalency of Canadian Quality Grades and Intramuscular Fat Measurements

Canadian Quality Grade	% IMF
Prime	9.8 +
AAA	5.0 – 9.7
AA	4.0 – 4.9
A	< 3.9

Table 4. An example of different selection goals for a Hereford Sire based on end use

Mainstream Market (YG and Marbling Based)		
	Maternal	**Terminal**
British Cows	↑ REA, = or ↓ Fat, ↑ or = IMF	↑ REA, ↓ Fat, = IMF
Continental Cows	= REA, = Fat, ↑ IMF	= REA, = Fat, ↑ IMF
Lean Market (Example: Laura's Lean)		
British Cows	↑ REA, ↓ Fat, ↓ IMF	↑ REA, ↓ Fat, ↓ IMF
Continental Cows	↑ REA, ↓ Fat, ↓ IMF	↑ REA, ↓ Fat, ↓ IMF

For most Canadian producers the impact of fertility (reproduction) traits on overall profitability is still significantly more important than either growth (production) or carcass (product) traits. As producers enter into alliances or vertically integrated production systems, where overall returns are greatly affected by end product characteristics, the selection pressure that is placed on carcass traits should increase.

Table 5. Relative Selection Emphasis Based on Production System

	Reproduction	**Production**	**Product**
Standard Production System	10	2	1
Alliance System	4	2	1
Vertically Integrated System	1	1	2

The best way to determine optimal levels for specific carcass traits is to observe the EPD levels of sires that have been used within a specific management system. By observing the performance levels of the offspring, it is then possible to determine what traits need to be maintained or changed, and in which direction. This benchmarking process is essential when beginning to use carcass traits in a selection program.

Key Points

1. Raw, unadjusted scan information is not informative.
2. Ultrasound data on seedstock cannot be compared with carcass data from feeder cattle
3. Ultrasound data cannot be compared between herds.
4. Carcass EPDs are comparable across herds.
5. Producers will need to benchmark the performance of their cattle in order to determine optimal EPD levels for their production system.

by Sean McGrath August 2006