

## USING BREEDOBJECT IN INDUSTRY TO HELP BREED MORE PROFITABLE CATTLE

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### SUMMARY

BREEDOBJECT is a selection aid to help breed more profitable cattle. It targets the purpose the user defines. It can be used by stud and commercial beef producers, or potentially anyone in the production chain with an interest in selecting animals. Examples are given of uses by bull breeders, bull buyers, breed societies, semen companies and others. Opportunities for service providers are numerous, but payoffs depend on the capacity of users to capture sufficient of the benefits accruing from genetic improvement and the better identification of superior sires.

**Keywords:** Beef cattle, breeding objectives, selection, indexes

### INTRODUCTION

Beef production is increasingly market driven. With this trend has come a greater need to balance different market traits and herd production traits when selecting seedstock. BREEDOBJECT (Barwick et al. 1992, 1994) is a selection tool for use with BREEDPLAN. It is a PC software package that helps with selection by drawing all the estimated breeding value (EBV) performance figures on a bull into a combined EBV for profit which describes how well the bull suits the user's purpose.

### HOW BREEDOBJECT WORKS

First, BREEDOBJECT performs a trait-level analysis of what affects profit in the commercial herd the user specifies. The user defines the herd by providing production and cost estimates about it via a questionnaire. The results of this financial analysis define the breeding objective, i.e., how much improvement of different traits is worth in the commercial herd. In a second step, all available information on genetic relationships is used by BREEDOBJECT to estimate the linear function of available EBVs that is most correlated with the objective (Schneeberger *et al.* 1992). This function is the \$Index. It is an EBV for profit in the commercial herd. Ranking seedstock on their \$Index sorts them for their progenys' expected profitability in the user's commercial herd.

### BREEDOBJECT - WHO CAN USE IT ?

BREEDOBJECT is designed for use by bull breeders and bull buyers, but can potentially be used by anyone in the beef chain for whom selection is an issue. Users can include

- individual bull breeders and bull buyers

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\* AGBU is a joint institute of NSW Agriculture and the University of New England

- affiliated groups of bull breeders or bull buying clients
- breed societies
- semen companies
- feedlots, e.g. accessing feeder steers of defined genetic potential
- service providers to each of these groups

#### **EXAMPLE USES**

**Assessing trait importance for different circumstances.** Trait importance for breeding can be different in bulls used to produce beef for different markets (e.g. Domestic vs Japanese) or in different environments (Barwick and Henzell 1997). What traits are valuable in sires also differs for a buyer of feeder steers compared with the beef production chain as a whole. Cow traits, such as fertility and calving ease, are of value to the whole production chain, but are not of direct value to the finisher.

**Use as a selection aid.** Table 1 shows EBVs on bulls, including \$Index EBVs for Domestic yearling beef production and production for Japanese high quality markets. In this example, bulls are ranked for profitability for the Domestic case. The Table illustrates the type of BREEDOBJECT information that is used in selection applications. Applications can differ in the type of animals evaluated, in how many \$Index EBVs are considered, and in which \$Index EBV is used for selection.

**Ranking bulls in seedstock herds.** Bull breeders can use BREEDOBJECT to help identify sires (and cows) for use in their breeding program. Sires might be home-bred sires, young bulls or potential AI sires from sire summaries. Ranking would be on the \$Index EBV for profit for commercial herds that in the breeder's view will be most important into the future.

**Ranking bulls as a service to clients.** Rankings for two or more \$Index EBVs might also be presented in sale catalogues to help clients choose bulls. As a further service, a customised listing can be provided to particular clients.

**Ranking sale bulls by prospective buyers.** Bull buyers can derive the \$Index for profit in their own herd and use this to compare sale bulls from alternative sources. EBVs on sale bulls can be obtained from BREEDPLAN provided owners of the sale bulls agree. Armed with the BREEDOBJECT ranking the buyer can attend sales with issues of performance needs settled. Top ranked bulls can then be assessed visually and sale day effort put into getting best value for money.

**Identifying elite young sires and assisting breed development.** BREEDOBJECT can be used by breed societies to help guide breed development. In some breeds it is being used to help identify promising young bulls for further testing (eg. Nicol and Barwick 1995b). Summary BREEDOBJECT rankings can be provided in sire summaries. BREEDOBJECT is also being used to help assess merit in performance-based show classes.

**Identifying AI sires.** Semen sellers can use BREEDOBJECT to screen bulls for their suitability for different markets to help decide which bulls should be collected and further tested.

**Table 1. Example rankings of bulls using BREEDOBJECT**

Ident.	GROUP BREEDPLAN EBVs <sup>A</sup>											\$INDEXES	
	CEd	CE dtrs.	BWd	200m	200d	400d	600d	DC	SS	FD	EMA	Japanese H.Qual	Domestic Yearling
114	-0.9	+0.8	+4.7	+5	+32	+78	+84	-1.9	+1.4	-0.2	+5.6	+68	+31
214	0.0	+1.5	+6.4	0	+40	+74	+97	-1.2	+0.2	+0.1	+6.6	+80	+30
35	-2.0	-1.6	+6.1	+11	+55	+95	+124	+4.1	+0.1	+0.8	+2.6	+77	+28
47	-0.4	+0.2	+4.6	+11	+32	+57	+77	-2.9	+2.4	+0.7	+2.8	+59	+24
142	-0.1	+0.9	+5.3	+4	+32	+60	+85	-0.7	+0.4	+0.6	+4.4	+64	+24
340	+3.9	+0.5	-1.0	+10	+17	+48	+60	+4.3	+0.5	+1.4	+1.9	+32	+21
925	+1.9	+1.7	+2.8	+9	+16	+33	+47	-4.2	+0.5	+0.8	+2.1	+38	+20
72	-1.1	-4.8	+2.1	+3	+19	+37	+60	-5.4	-0.5	+1.8	-1.7	+33	+11
25	-9.3	-3.3	+8.3	+2	+34	+54	+82	-4.3	+0.3	-0.4	+2.6	+62	+10

<sup>A</sup>EBVs in turn: Calving Ease (direct), Calving Ease (daughters), Birth Weight (direct), Milk, 200, 400 and 600 day Weight, Days to Calving, Scrotal Size, Fat Depth, Eye Muscle Area

**How much to pay for a bull.** Because the \$Index has dollar units, with experience it can be used to help decide how much extra to pay for bulls that are to be joined to commercial cows. If a bull is joined to around 100 cows in his normal working life, a bull with a \$Index EBV of +42 will leave commercial progeny worth \$2100 more than a bull with a \$Index value of 0. Buyers can establish the relative value of bulls in a sale catalogue by using these relative differences in value. What price might be paid can be assessed from these relative differences together with the average \$Index EBV and an estimate of what the average bull price at the sale might be. Last year's average sale price and the current market are useful indicators of likely average sale price.

**A selection example.** The bar chart (Figure 1) shows an example of the selection emphasis achieved on each EBV when selection is on the \$Index EBV for domestic yearling beef production. In this case the top 20 percent of bulls have been chosen and the mean EBVs of chosen bulls compared against those for all bulls. The individual EBVs, in abbreviated form, are indicated along the bottom of the chart. The bars show the relative size and the direction of the emphases. All emphases are desirable except for a slightly lower calving ease. The emphasis on calving ease is easily modified for cases where there is greater concern about calving ease.

When there is a lot of concern about calving ease, sires with low birth weight EBVs are often chosen above all else. The greater calving ease achieved this way comes at a high cost in lost response in other valuable traits.

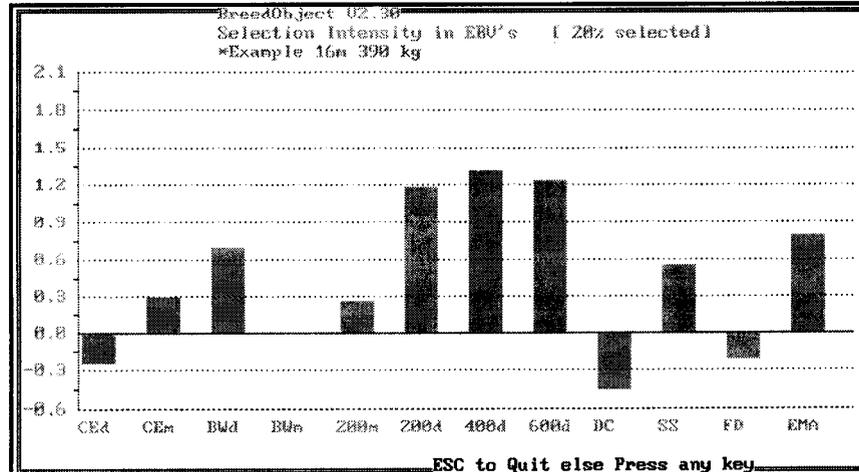


Figure 1. Example selection intensities achieved on BREEDPLAN EBVs using

**BREEDOBJECT HOW SERVICES ARE AVAILABLE TO BREEDERS**

BREEDOBJECT is available through trained service providers. A list can be obtained from the Agricultural Business Research Institute (ABRI). It is especially important that trained service providers be involved in the initial setup. Breeders can then either have ABRI process and report the rankings on animals or can buy a smaller breeder version of the software that allows ongoing processing to be done on-farm. BREEDPLAN EBVs for animals of interest can be obtained on disc from ABRI. AGBU runs short courses to train service providers in use of the program. So far 23 have completed the course, including some researchers.

A difficulty is that the market for services is small. Not all breeds have EBVs that cover the range of trait complexes, including fertility, growth, carcass and calving ease, or don't have them yet with the accuracy to be able to make full use of the system.

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**REFERENCES**

Barwick, S.A., Fuchs, W., Davis, G.P. and Hammond, K. 1992. *Proc. Aust. Assoc. Anim. Breed. Genet.* 10: 565  
 Barwick, S.A. and Henzell, A.L. 1997. *Proc. Assoc. Advmt. Anim. Breed. Genet.* 12:490

Barwick, S.A., Henzell, A.L. and Graser, H.-U. 1994. *Proc. 5th World Congr. Genet. Appl. Livestk. Prod.* **18**: 227

Nicol, D. and Barwick, S.A. 1995. *Proc. Aust. Assoc. Anim. Breed. Genet.* **11**: 238

Schneeberger, M., Barwick, S.A., Crow, G.H. and Hammond, K. 1992. *J. Anim. Breed. Genet.* **109**: 180