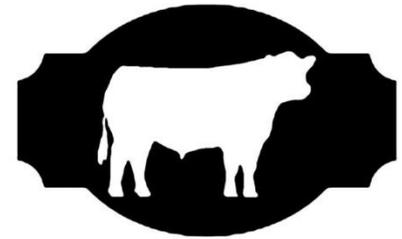# OSU Across-Breed EPD Calculator

Beef Cattle Sciences

Instructions for Software Use [1]

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Introduction

The benefits of cross-breeding in cattle have been well documented in research. However, implementation of cross-breeding systems can be viewed as complicated. One of the issues with cross-breeding has been the complication of sire selection. Expected Progeny Differences (EPD) are not universal and standard among breed associations. Successful cross-breeding programs recognize that comparison of sires of different breeds must take into account these mathematical calculations and make adjustments to the EPD values accordingly. Once adjustments are made, sires of different breeds can be compared and proper sire selection can be accomplished to improve the genetic influence multiple sires can have on a cow herd. The Across-Breed EPDs (AB-EPDs) are most useful to commercial producers purchasing bulls of more than one breed. For example, in terminal cross-breed systems, AB-EPDs can be used to identify bulls in different breeds with high growth potential or favorable carcass characteristics.

Across-Breed EPD Adjustments

The Meat Animal Research Center (MARC) in Clay Center, Nebraska, generates breed adjustment factors using the most recent genetic evaluations for eighteen different breeds. These adjustment factors change every year (Figure 1).

Using OSU Across-Breed EPD Calculator

The OSU Across-Breed EPD Calculator is a tool to help commercial cattlemen evaluate and compare sires of different breeds using adjustment factors generated from the MARC data. The program allows producers to compare sires on a basis that is most familiar to them. For example, if the producer has historically purchased Limousin bulls, but has decided to purchase Charolais bulls, the program will allow the producer to generate EPD values for the Charolais bull that are equivalent to Limousin generated EPD values. This will allow the producer to compare his existing bull battery to the potential Charolais bulls for sale. Likewise, the program also gives the producer the option to enter EPD values a potential bull should have using EPD values of a familiar breed, in this

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example Limousin, basis. The program can then generate the EPD values for those traits as would be seen in the sire catalog for the Charolais bulls.

Software Compatibility

The OSU Across-Breed EPD calculator is a Microsoft Office Excel® Macro-Enabled Worksheet. It has been formatted to run most efficiently in Excel 2016. However, an alternative version that will function using older Excel versions is available. In order for all of the features to work, macros must be enabled. The OSU Across-Breed EPD calculator can be downloaded from the OSU Beef Cattle Library at http://blogs.oregonstate.edu/beefcattle/ or contact your local OSU Extension Office. Data for the program will change yearly according to the most recent USMARC AB-EPD data. Therefore, the software program will change yearly as well. New versions will be made available through the website listed above.

2017 Across Breed EPDs

Breed Code	Breed	Birth Wt ADJ Factor	Weaning Wt Adj Factor	Yearling Wt Adj Factor	Maternal Milk Adj Factor	Marbling Adj Factor	REA Adj Factor	Fat Thickness Adj Factor	Carcass Wt Adj Factor
1	Angus	0.0	0.0	0.0	0.0	0.00	0.00	0.000	0.0
2	Hereford	2.1	-9.2	-34.3	-18.0	-0.30	-0.08	-0.056	-61.5
3	Red Angus	2.5	-32.8	-43.9	2.9	-0.23	-0.06	-0.014	-14.5
4	Shorthorn	4.6	-32.3	-18.9	4.6	-0.11	0.38	-0.094	-6.9
5	South Devon	3.0	-11.9	-30.7	2.9	-0.08	0.30	-0.133	-24.6
6	Beefmaster	4.6	18.3	-8.2	6.5	NA	NA	NA	NA
7	Brahman	10.2	45.7	1.2	23.6	-0.75	-0.03	-0.140	-28.9
8	Brangus	3.3	11.0	-1.7	9.1	NA	NA	NA	NA
9	Santa Gertrudis	5.0	35.0	31.1	15.7	-0.56	-0.10	-0.081	-5.4
10	Braunvieh	2.0	-24.9	-55.7	0.3	-0.67	0.84	-0.091	-47.4
11	Charolais	7.7	33.9	34.1	7.3	-0.35	1.17	-0.208	17.4
12	Chiangus	3.1	-22.0	-36.8	-0.7	-0.24	0.43	-0.091	-14.9
13	Gelbvieh	2.8	-23.0	-34.8	4.1	-0.29	0.76	-0.109	-16.4
14	Limousin	2.3	-15.4	-42.2	-13.4	-0.39	1.01	-0.112	-10.9
15	Main-Anjou	3.7	-31.1	-45.1	-3.8	-0.51	0.90	-0.172	-19.5
16	Salers	1.7	-10.7	-34.2	6.2	-0.03	0.92	0.186	-28.6
17	Simmental	3.0	-9.5	-16.9	3.3	-0.34	0.48	-0.120	2.7
18	Tarentaise	3.1	26.8	3.5	22.9	NA	NA	NA	NA

Figure 1. MARC Across-Breed EPD Adjustment Factors

Getting Started

Open the OSU Across-Breed EPD Calculator. The program consists of four sheets entitled: Sheet 1, Across-Breed EPD Table, Setting EPD Parameters and Compare Multiple Sires. You can access these sheets in one of two ways; 1) move mouse arrow over the "Go" Button on the desired section and left click, or 2) move mouse arrow over desired tab at bottom of the page and left click (Figure 2). You can move from sheet to sheet by method 2.

Note: Macros free version will not have dropdown boxes or print buttons. Breed codes must be manually entered using the "Breed Table" as a reference. For example, if the breed is Hereford, you enter Breed Code 2.
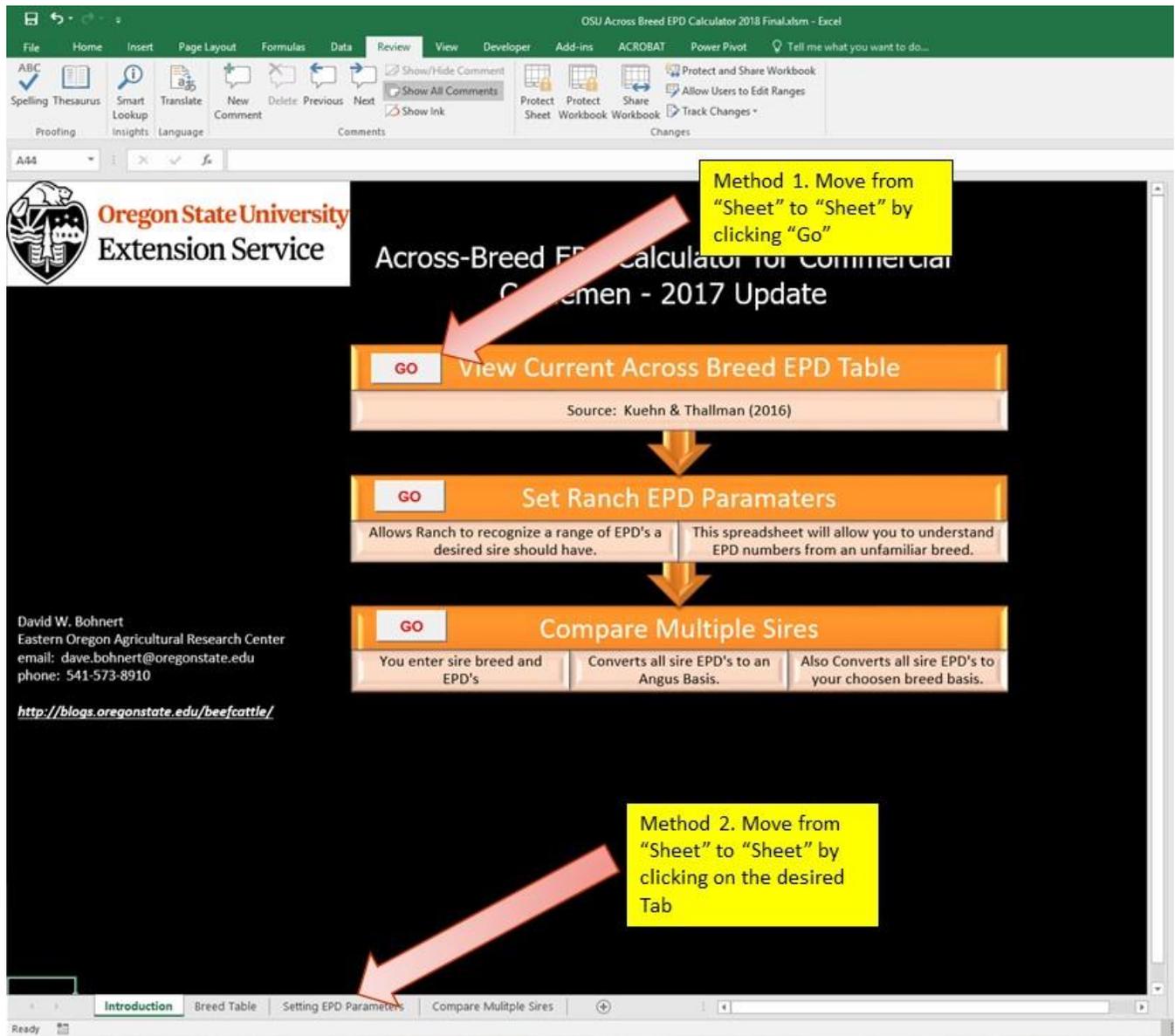

Figure 2. "Introduction" sheet of OSU Across-Breed EPD Calculator

Viewing Breed Table

The Breed Table Sheet cannot be manipulated by the user. The sheet displays the AB-EPD adjustment factors used for generating data on the other sheets. Note the year in which the data was published will be displayed in the upper right-hand corner (Figure 1).

Setting EPD Parameters

Sire selection requires knowledge of the long term objectives of the operation and a fundamental understanding of EPD's. Typically a producer has a range of acceptable EPD values in mind for particular traits.

This sheet will allow a producer to work with EPD values for a familiar breed and then generate equivalent EPD values for a breed that is less familiar. For example in Figure 2, the producer enters the familiar breed (Breed A) into the drop-down box (*or enter breed code in manually*). In this example the producer is accustomed to purchasing Limousin bulls and therefore has a predetermined set of parameters for each trait. The values he is familiar with are based on the Limousin breed. However, the producer has decided to purchase a Charolais bull (Breed B). He is not familiar with EPD values for Charolais. This sheet will allow the producer to enter parameters based on Limousin EPD values and return the equivalent EPD values for the Charolais bulls as would be seen in a Charolais catalog.   The parameter worksheet can be printed for reference by clicking on the "Print Parameters" button located on the bottom left *(not available in macros free version)*.

Figure 3. Setting EPD Parameters.

Compare Multiple Sires

Comparing multiple sires is important for determining which sires you may want to purchase or use as an AI sire. This sheet (Figure 3) gives the producer the opportunity to manually insert the EPD values for the traits

listed (Section I). The calculator will return the sires EPDs on an Angus Basis (Section II). However, a producer may not be comfortable with Angus EPD values and may choose all sires to be converted to a breed basis in which he/she is more familiar with (Section III). You will need to use the scroll bar to move from section to section.

Figure 4. Compare Multiple Sires Worksheet (Section I)

Data in Section II is generated by the user inserted data from Section I. This chart can be printed by clicking on the "Print Sire Comparison on an Angus Basis" button located on the bottom left *(not available in macros free version).*

Figure 5. Compare Multiple Sires Worksheet (Section II)

Section III of this worksheet will convert all sires to a user defined breed basis. The user defined breed can be chosen by the drop down box. These results can be printed by clicking the "Print Sire Comparison on a User Defined basis" button located on the bottom left *(not available in macros free version)*.

Figure 6. Compare Multiple Sires Worksheet (Section III)

Conclusion

The OSU Across-Breed EPD Calculator is a tool that commercial cattlemen can use to make sire selection from multiple breeds more comprehensive. A producer has the ability to view EPD values in a format that is most familiar to them.

References

Kuehn & Thallman. 2017. BIF Proceedings.