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Adjusting Yearling Weight Ratios for Prior Selection

J. Vanmiddlesworth, R. R. Schalles, and G. A. Milliken

Summary

We deveoped a procedure to compare yearling weight ratios of a calf crop when the calves have been on different management or feeding regimes. This procedure will also produce more meaningful sire and dam summaries.

Introduction

When a purebred breeder castrates part of his bull calves at weaning, puts some in the central bull test, and feeds some out at home, it is difficult to compare these animals. Because yearling weights are so important, he would like to compare yearling weights among all of his bull calves. That also would improve his evaluation of sires and dams. Our procedure allows comparisons.

Method and Example

When calves with the highest weaning weight are selected for one management system, and calves with lowest weaning weight are selected for another, yearling comparisons cannot be made. Calves within each management system can be compared and the average yearling weight ratio of each contemporary group will be 100. Because of the high genetic correlation between weaning weight and yearling weight (approximately 0.79), the lowest group at weaning should also have the lowest average ratio at yearling. The adjustment method presented here takes advantage of this high genetic correlation and the known amount of change in the mean due to a given amount of selection.

The adjustment (table 1) is added to the yearling weight ratios of the contemporary group with high weaning weight and is subtracted from those of calves selected for lower weaning weights. The adjustment works only if selection is based on weaning weight. The percent of animals selected for a contemporary group is given in the first column of table 1. The adjustment (last column) is added to or subtracted from the yearling weight ratios for the appropriate contemporaries.

For example, a breeder has 21 bulls in his calf crop (table 2). He castrates the 60% (13 calves) with the lowest weaning weights leaving 40% (8 calves) as bulls. At yearling, the 8 bull calves are contemporaries with an average adjusted 365 day weight of 975 lbs. The contemporary yearling weight ratios are obtained by dividing each bull's weight by 975 and multiplying by 100. Since 40% were selected, each contemporary yearling weight ratio has 7 (from table 1) added to give the adjusted

yearling weight ratio in table 2. The 60% with the lowest weaning weights were castrated, giving them a ratio higher than they really should have, since the ratio is based on their contemporaries. So 60% selection adjustment of 5 (table 1) is subtracted from their contemporary yearling weight ratios. This will give an estimate of the true yearling weight ratio of all calves, both intact and castrated.

With this procedure, the entire calf crop can be compared. A breeder could castrate part of his calves, performance test some as bulls on the farm, and send some to a central bull test, and still be able to compare all calves in the bull calf crop, providing selection is based on 205-day adjusted weaning weight, making a sire summary and dam summary for yearling weight much more meaningful.

Table 1. Yearling Weight Ratio Adjustments.

% Selected	Adjustment[a]
95	1
90	1
85	2
80	2
75	3
70	4
65	4
60	5
55	5
50	6
45	6
40	7
35	8
30	8
25	9
20	10
15	11
10	13
4	15
3	16
2	17
1	19
.5	21

[a]Adjustment to be added or subtracted to yearling weight ratio after selection is practiced at weaning.

Table 2. Example of using Yearling Weight Ratio Adjustment Factor

Calf I.D.	Sire	205 day weight	365 day weight	Contemporary yearling weight ratio	Adjusted yearling weight ratio
40% selected at weaning for bulls					
14	A	468	929	95	102
31	B	445	1026	105	112
4	A	425	889	91	98
41	B	427	1019	104	111
25	B	416	1009	103	110
30	A	404	964	99	106
15	B	405	983	101	108
7	A	400	980	100	107
Averages		424	975	100	107
60% castrated at weaning					
35	A	397	692	104	99
22	A	395	716	108	103
8	A	390	734	110	105
40	B	389	677	102	97
48	B	388	643	96	91
20	B	385	708	106	101
12	A	384	750	113	108
10	A	375	699	105	100
19	B	364	682	102	97
17	B	328	577	87	82
36	B	322	605	91	86
3	A	298	603	90	85
2	B	242	570	86	81
Averages		358	666	100	95
Sire Summary					
Sire A		4 bulls	940	96	101[a]
		6 steers	699	105	
Sire B		4 bulls	1009	103	98[a]
		7 steers	637	96	

[a]Adjusted bull yearling weight ratio and adjusted steer yearling weight ratio can be averaged together bacause of the adjustment.