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# *Influence of sire genotype for the beef production sub index on progeny performance*

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## Introduction

The Irish Cattle Breeding Federation (ICBF) launched beef genetic indices in 2005 which rank animals for profitability through the use of indexes to aid farmers in comparing animals on genetic merit for the profitability of their progeny. One of the indexes is the 'Beef Production Sub Index' (BPSI). Traits (relative emphasis included in parenthesis) included in the BPSI include carcass weight (46%), weaning weight (24%), carcass conformation score (11%) dry matter intake (12%) and carcass fat score (7%). The objective of this study was to quantify any differences in performance of progeny from high and low merit sires ranked for profitability in the beef production sub index (BPSI) and sire predicted transmitting ability for carcass weight (PTAcwt).

## Materials and Methods

In 2005, 22 sires of high (n=11) and low (n=11) genetic merit based on the BPSI were identified. Average reliability of the sires chosen was 90%. Sire breed was balanced across genotype and consisted of Charolais (n=5), Belgian Blue (n=1), Limousin (n=3) and Simmental (n=2). Bull and steer progeny were sourced from 28 suckler herds as weanlings and the present results deals only with the bull progeny. Following parentage verification using DNA, 44 bull progeny remained for analysis. From January 2006 they were accommodated indoors and the daily concentrate allowance was gradually increased and silage decreased. In early February they were offered an *ad libitum* concentrate diet and 1 kg dry matter of grass silage as roughage until slaughter on 26$^{th}$ June 2006 at on average 470 days of age. Records taken on the live animal included liveweight at 28 day intervals and individual daily feed offered and refused for the 132 day trial period. Energy values (UFV) for concentrates and silage were calculated using feed tables of O'Mara (1996). Average daily gain (ADG) was calculated using monthly liveweight by linear regression. At slaughter, carcass weight, carcass grades were recorded and the right side of each carcass was dissected into meat, fat and bone. Conformation score was on a continuous scale of 1(poor) to 15 (excellent). Fat score was also on a scale of 1 (lean) to 15 (fat).The data was analysed using PROC MIXED (SAS, 2006) to determine the effect of BPSI and predicted transmitting ability for carcass weight ($PTA_{CWT}$) on energy intake (UFV g/day), ADG, slaughter and carcass weight, conformation and fat scores, killout (KO), and carcass proportions of meat, fat and bone. BPSI and $PTA_{CWT}$ were treated as continuous variables. In the analysis sire was included as a random effect and the fixed effects of parity of dam, week of birth, sire and dam breed and dam age were tested for significance in the model. For repeated measures (weekly average energy

intake and monthly liveweight) age was included as a repeated effect with a first order autoregressive correlation structure assumed among records within animal.

## Results and Discussion

Table 1 shows the effect of a unit increase in sire BPSI and $PTA_{CWT}$ on a range of progeny performance traits. Energy intake, ADG, slaughter weight, carcass weight and conformation score increased with BPSI although none of the effects were significantly different from zero. Conformation scores increased as BPSI and $PTA_{CWT}$ increased, but again these were not significant. May et al. (1992) stated that carcass fatness and muscle score had the most influence on live and carcass value. Liveweight at slaughter and carcass weight increased significantly ($P<0.05$) with increased $PTA_{CWT.}$ The increase in carcass weight of 1.31 kg per unit $PTA_{CWT}$ is slightly greater than the expectation of 1 kg. The similarity in regression coefficients between BPSI and $PTA_{CWT}$ is due to the relatively larger emphasis (55%) of carcass weight in the BPSI. Energy intake and daily gain were positively (NS) associated with increased $PTA_{CWT.}$

## Conclusions

Sire $PTA_{CWT}$ was significantly associated with heavier animals at slaughter, while the respective associations with BPSI approached significance ($P<0.10$). Although $P>0.05$ bulls of greater genetic merit for BPSI had lower killout % which does cause concern as the opposite would be expected.

## References

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**Table 1.** Mean values and regression co-efficient for (standard errors in parenthesis) BPSI and $PTA_{CWT}$

| Trait | Mean | BPSI (€) | PTAcwt (kg) |
|---|---|---|---|
| Intake (UFV/day) | 9642 | 6.3(5.66) | 28.7(18.47) |
| ADG (g/day) | 1459 | 1.4(1.39) | 5.2(4.43) |
| Slaughter (kg) | 602 | 0.5(0.28) | 2.38(0.663)* |
| Carcass Wt (kg) | 351 | 0.3(0.17) | 1.31(0.521)* |
| KO (g/kg) | 590 | -0.04(0.145) | -0.24(0.473) |
| Conformation† | 11.11 | 0.004(0.006) | 0.012(0.0180) |
| Fat† | 7.78 | -0.007(0.006) | -0.011(0.012) |
| Meat (g/kg) | 732 | -0.48(0.163) | -0.48(0.521) |
| Fat (g/kg) | 89 | 0.02(0.117) | 0.23(0.377) |

† Scale 1 – 15 *(P<0.05)