The Value of Genetic Information to Bull Buyers: A Combined Revealed, Stated Preference Approach

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**Background:**
DNA profile information has begun appearing in purebred bull auction catalogs; however, the value of this information is as of yet unknown. This study uses data from actual bull sales at a test station and combines it with stated-preference survey data to determine the value of the DNA profile information.

**Objective:**
- Determine the extent to which cow-calf producers value DNA profile information.
- Establish bull buyers’ valuation of bull information.

**Methods:**
Using a hedonic regression approach, the implicit values of bull characteristics can be inferred.

The values of each survey bull (SP) were estimated using equation (8).

\[
WTP_i = \beta_0 + \sum_{j=1}^{26} \beta_j x_{ij} + \epsilon_i .
\]

The price of bulls sold at auction (RP) were estimated using equation (9).

\[
price_i = \beta_0 + \sum_{j=1}^{26} \beta_j x_{ij} + \sum_{j=1}^{26} \beta_j \text{ sale} x_{ij} + \epsilon_i .
\]

**Data:**

**Revealed Preference Data**
Sale price, test performance, EPDs, ultrasound information, and Igenity scores were collected on individual animals from three Oklahoma Beef Inc. (OBI) performance-tested bull sales held in the Spring of 2009, Fall of 2009, and the Spring of 2010. Over the three sales, data were collected on 238 Angus bulls. The average price paid was $2,363.00. Figure 1 is a bull which sold in the Spring 2010 sale and shows the variety of information provided in the catalog.

**Stated Preference Data**
In the Summer of 2010, a mail survey was sent to all previous OBI bull buyers. Each survey presented the respondent with nine hypothetical bulls and asked the buyer to indicate the most they would be willing to bid for each bull if at auction. The survey was formatted to look almost identical to the catalog buyers receive at the OBI sale. Figure 2 shows one of the questions on the survey in which buyers were asked to indicate their maximum willingness-to-pay.

**Results and Conclusions:**
As a producer purchasing a bull, both performance and EPD genetic information on the breeding potential of the animal is shown to be relevant and significantly impacts the price received. A bull buyer should note the importance of simply providing information regardless if the ‘score’ is thought to be favorable of the bull, therefore even if the EPDs or test performance scores are not highly sought after, a premium will be awarded to the bull for the information itself.

Results show that producers currently place small value on the information presented in a DNA profile score, yet it is unknown if this will change over time. As more bulls continue to be sold with Igenity DNA profile information, the analysis can be replicated and thus strengthened. Similar to the introduction of EPDs, producers required time to become familiar, educated, and confident in the information captured by an EPD value, likewise the value producers receive from Igenity premium will likely increase with time.

**Table 1. Willingness to Pay for Beef Bulls ($) Estimates from Mixed Models for Stated Preference (SP) and Revealed Preference (RP) Data**

<table>
<thead>
<tr>
<th>Bull Attribute</th>
<th>Survey Data (SP)</th>
<th>Sale Data (RP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>212.53 (572.70)*</td>
<td>-2613.04* (908.06)</td>
</tr>
<tr>
<td>Attributes in SP and RP Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doublty Igenity</td>
<td>6.60 (12.22)</td>
<td>64.41* (24.09)</td>
</tr>
<tr>
<td>Intramuscular fat ultrasound</td>
<td>18.98 (20.37)</td>
<td>-112.06* (42.70)</td>
</tr>
<tr>
<td>Bull birth weight</td>
<td>-11.53* (2.34)</td>
<td>-30.34* (3.91)</td>
</tr>
<tr>
<td>Birth weight EPD</td>
<td>-104.98* (15.18)</td>
<td>-73.65* (34.36)</td>
</tr>
<tr>
<td>Yearling weight EPD</td>
<td>8.06* (2.44)</td>
<td>9.04* (4.04)</td>
</tr>
<tr>
<td>Attributes in SP Data Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth weight EPD missing</td>
<td>-293.37* (53.03)</td>
<td>-</td>
</tr>
<tr>
<td>Yearling weight EPD missing</td>
<td>-343.59* (52.70)</td>
<td>-</td>
</tr>
<tr>
<td>Milk EPD missing</td>
<td>-61.11 (52.81)</td>
<td>-</td>
</tr>
<tr>
<td>Marbling EPD missing</td>
<td>-104.27* (52.70)</td>
<td>-</td>
</tr>
<tr>
<td>Attributes in RP data only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scrotal circumference</td>
<td>-3.27 (11.73)</td>
<td>-</td>
</tr>
<tr>
<td>Carcass weight EPD</td>
<td>-8.19 (6.69)</td>
<td>-</td>
</tr>
<tr>
<td>Fat thickness EPD</td>
<td>-524.51 (894.21)</td>
<td>-</td>
</tr>
<tr>
<td>Ribeye area EPD</td>
<td>-34.67* (15.32)</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: Asterisk (*) represents statistical significance at the 5% level or lower.

* Numbers in parentheses are standard errors.
* Only partial results are presented in this table.