What is the value of information about animal health in the Australian beef supply chain?

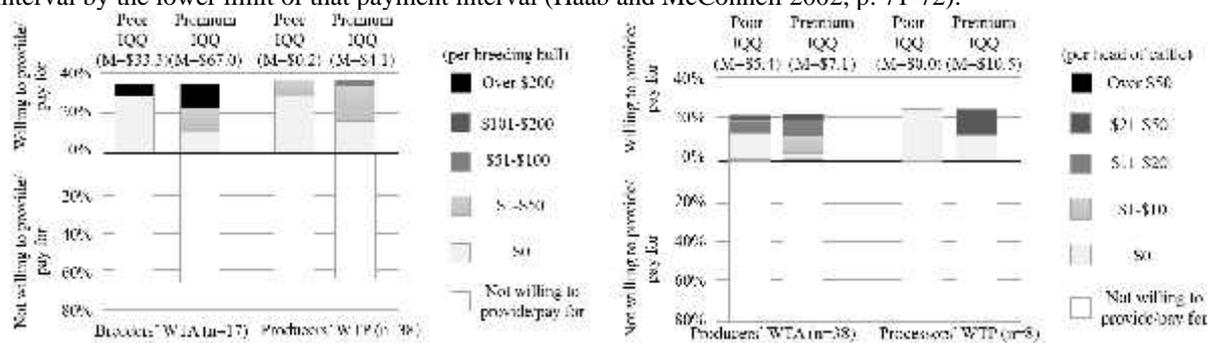*Y. Zhang[A,C], D. Baker[A], G. Griffith[A,B], E. Morales[A] and N. Hoang[A]*

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Information about animal health can signal the quality of both bulls and commercial cattle. This information flows in both directions in the beef supply chain (SC): provision of information when selling products ('sharing out') and receipt of information (perception) when purchasing products ('sharing in'). Sharing out this information has been shown to add value to the products via differentiation actions such as certification (Grunert 2005), while sharing in this information can mitigate buyers' uncertainty and transaction costs. Information quality and quantity (IQQ) are two key aspects of information that may have substantial impacts on the value of information perceived by different actors in the SC. Due to the lack of clear price signals in the Australian beef SC (Australian Competition and Consumer Commission 2018), incentives may be compromised when the improvement of information flows is likely to benefit some actors but generate costs for others in the SC. It may result in chain failure: when a value chain fails to maximise chain surplus (Mounter *et al.* 2016). Measuring the value of information across various stages in the SC is important to address these issues, and to inform policy and governance for industry-wide action to facilitate improvements, and to develop information-related product differentiation for marketing.

The contingent valuation method was adopted to elicit upstream SC actors' willingness to accept (WTA) and/or willingness to pay (WTP) for information. We used a subset of data from an Australian red meat SC survey which was conducted on-line, from May to October 2018. The sample consists of 17 bull breeders, 38 cattle producers, and 8 beef processors. It firstly identified whether or not the decision maker is willing to provide or receive the information about the heath status of breeding bulls or cattle. Within those respondents who answered "yes" (about 35% and 20% of respondents in Figure 1a and 1b respectively), the monetary value of this information was then quantified at two levels of IQQ: a) poor IQQ: the information is of poor accuracy, precision, and consistency and is recorded on a herd basis; and b) premium IQQ: the information is of premium accuracy, precision, and consistency and is recorded on an individual animal basis. Five payment intervals at both IQQ levels were provided. The distribution of valuations is presented in Figure 1. The lower bound for mean WTA and WTP (shown as 'M' in Figure 1) was obtained by multiplying the probability of each value interval by the lower limit of that payment interval (Haab and McConnell 2002, p. 71-72).

Information about the heath status of breeding bulls (a)   Information about the heath status of cattle (a)

Figure 1. Frequency distribution of WTA and WTP for information

All groups of respondents in our sample placed more value on information of premium IQQ, than that of poor IQQ. The gaps between WTP and WTA were also observed, which are the potential causes of chain failure. These results imply that the key to mitigating or correcting for this failure is in changing incentives for information provision so that they better reflect true values. This would incentivise information providers to share information and to improve IQQ. Such derived monetary value of information can be compared to costs, in decision making along the SC. For bull breeders and cattle producers, this represents incentives for management change, as well as for longer term decisions such as investment in information about animal health.

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