

Evaluating the Farmer’s-Share-of-the-Retail-Dollar Statistic: Rebuttal

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Economists, and especially those who chose to serve as presidents of organizations of economists, owe their audiences some basic things: objectivity, research, understanding, and evidence-driven conclusions are surely among them. But the WAEA Presidential address delivered by Gary Brester failed to exhibit all four of these criteria. Brester started with a conclusion, failed to subject it to objective analysis, failed to test it with evidence, and clung to his desired conclusion in the face of massive contrary evidence.

Brester asserted a sharply critical claim that marketing margin data has been used inappropriately to analyze anti-competitive behavior for livestock markets. Yet, Mr. Brester’s comments demonstrate that he utterly failed to investigate his topic, failed to avail himself of available public data including the entire trial record and evidence in the *Pickett v Tyson* lawsuit, and he conducted no review of published, peer-reviewed data about the subject matter before leveling his unfounded, and unjustified, criticism.

Mr. Brester’s comments embody what he set out to criticize. His analysis, not that which he attacks, strongly suggests a process of reasoning from Conclusion backward to Introduction, unfettered by the facts. Brester said,

“A few agricultural economists have argued that recent increases in farm-to-wholesale marketing margins have clearly been caused by anti-competitive behavior in the food processing industry (Taylor, 2002) ... Some suggest the farm-to-wholesale beef price spread declined from 1980 to the mid-1990s because of increased processing efficiencies. However, the same economists argue that since the mid-1990s, anti-competitive behavior has been responsible for increases in the margin. ... I have yet to see this research meet peer-review criteria. I find it surprising that well-trained economists would take such a bivariate view of the world. While their conclusions could be correct, the lack of analytical rigor in the analyses is apparent. ... The conventional wisdom approach to the marketing margin issue lacks analytical rigor and represents a scientific failure.”

Brester’s unresearched theme continued in a recent article in this journal by Brester, Marsh and Atwood (BMA) on the farmer’s-share-of-the-retail-dollar (FS). Joined by co-authors, Brester asserted,

“... conventional wisdom often considers FS statistics (and their counterparts, marketing margins) as proxies for farm/ranch profitability and producer welfare. Furthermore, some have argued that decreases in FS statistics (and, by construction, increases in farm-to-retail marketing margins) are indicators of anti-competitive behavior in the food processing industry (Taylor, 2002; USDA,

2000).”

BMA went further by alleging that,¹

“... FS statistics (and farm-retail marketing margins) continue to be misused by economists ... in judicial proceedings, ... For example, reductions in the FS beef statistic (and associated increases in farm-wholesale beef marketing margins) was a focus of expert economic testimony for the plaintiffs in Pickett et al. v. Tyson Fresh Meats, Inc (2004) who sought damages allegedly caused by anti-competitive behavior in the beef packing industry. ... While the abuse of FS statistics and marketing margins transcends most agricultural commodities, the most publicized have occurred with respect to legislative and judicial actions related to the cattle and hog processing sectors.”

These serious charges asserted are untested, undocumented, unsubstantiated and patently false. The “conventional wisdom” straw man is based on only two references (Taylor, 2002; USDA, 2000), both of which are outreach articles and both of which are misrepresented by Brester and by BMA.

BMA’s characterization of *Pickett* and their statements about misuse of statistics by the economist representing plaintiffs in *Pickett* was made without a single reference to truck loads of legal documents, or to any reference to peer reviewed articles about *Pickett* litigation by Domina (2004a, 2004b), Green (2004), and Taylor (2006, 2007, 2008). *Amici Curiae* by McEowen, Harl, Carstensen and Stokes (2004), three of whom are law professors, was not cited nor were case summaries posted on the web site of the independent National Agricultural Law Center.²

Lengthy testimony and cross-examination of economists representing both sides of *Pickett* is a matter of public record. BMA did not bother with a reference to the trial evidence. He also ignored the fact that the jury, which posed economic questions to witnesses itself, deliberated for nearly a week before reaching its \$1.268 billion verdict for the producers. Supportive reports and affidavits by major producers dealing in hundreds of millions of dollars of cattle annually were submitted as expert materials. So were submissions by three fulltime commodities traders. These, too, went without any reference by BMA.

In the credits footnote to their article, BMA recognized “... the contribution of William Baumgartner ...” He was, we believe, one of Tyson’s lawyers in the *Pickett* case. Baumgartner could have given the authors the entire trial record in an easy download of data. Yet, Baumgartner apparently gave no affidavits, no testimony, and in the Brester publications, no affiliation was given for Mr. Baumgartner. Thus, we clarify that we suspect Brester referred, without disclosure, to William H. Baumgartner, Jr., who was one of many attorneys representing Tyson throughout the lengthy *Pickett* litigation. Tyson had over a dozen lawyers at trial. Baumgartner, and his law firm, have repeatedly represented Tyson in many legal matters.

² <http://www.nationalaglawcenter.org>

Many who read what Brester wrote, or heard what he said, might think he knew what he was talking or writing about. In fact, he did not. Here, the record is set straight on allegations and mischaracterizations in the challenged articles that make their unfortunate appearance in this Journal. To the extent allowed by the Court's Confidentiality Orders imposed at Tyson's request, analysis is presented here supporting the thesis that the Pickett plaintiffs correctly discerned anti-competitive evidence in the overt decline in producer participation in cash flow, measured from retail where beef is bought. It is hard to discern how one can analyze competition in the cattle market while ignoring what happens at retail. The two can be different markets, but they are inevitably connected.

Disclosures

We respectfully disclose these facts about ourselves. One of the authors, Domina, was co-lead counsel representing cattlemen in Pickett. Dr. Taylor testified on behalf of plaintiffs and was given access to an array of data concealed from the public by Tyson's requested court orders, but never seen by USDA or other academics if Tyson's representations about the data were true.

We also note for the reader that Ted Schroeder, who is on the Council of this Journal, testified for Tyson. Jerry Hausman, MIT econometrician, was the other economist who testified on behalf of Tyson. Mary Muth, JARE Editorial Council, directed a \$4.5 million taxpayer-funded livestock and meat marketing study by the consulting firm, RTI (Muth, 2007). Dillon Feuz (2008), JARE Editorial Council, recently testified to Congress that the "*beef packing sector was very competitive.*" Gary Brester, now editor of JARE, and Joe Atwood, his Co-Editor, were collaborators on the RTI study. John Marsh also collaborated in the RTI study.

Conventional Wisdom

First, Brester's assertions about misuse of FS statistics command our attention. Brester, citing only an outreach publication by Taylor (2002), claimed, "... *economists argue that since the mid-1990s, anti-competitive behavior has been responsible for increases in the (beef farm-to-wholesale) margin.*" This is true, but in all fairness Brester should have noted that the article included discussion of various factors that could explain changes in the farm-to-wholesale (FW) margin, concluding with the statement that "*exertion of oligopsony power is the only plausible explanation for the strong upward trend in the (inflation adjusted) FW spread for beef.*" As Brester should know and model, there is danger in removing phrases from their truthful context.

Brester continues the reference to Taylor (2002) "*... I have yet to see this research meet peer-review criteria. ... the lack of analytical rigor in the analyses is apparent. ... The conventional wisdom approach to the marketing margin issue lacks analytical rigor and represents a scientific failure.*"

Unfortunately, Mr. Brester *never, to this day, requested to see* that data he complained he had not seen. He *neglected to perform* the analysis he claimed was not performed, and he *neglected to learn* what Dr. Taylor's theoretical and empirical work consisted of just as he *failed to learn* that review of Dr. Taylor's work was conducted, and testified to, by

professional, academic agricultural economists and by intensively involved people within the industry. Mr. Brester's rank charges are akin to the prosecutor's decision to charge a randomly chosen defendant with bank robbery after hearing the bank had been robbed at the coffee shop but no arrests had been made.

Brester apparently overlooked Footnote 4 in Taylor's outreach publication (2002). It states, "*It has been suggested that the FW price movements are due to factors such as price dynamics, competition with other meats, production levels, and expansion versus contraction phases of the industry. However, I have done extensive econometric analyses of beef, pork and poultry spreads, including these factors as candidate explanatory variables. Although some of these variables are statistically significant in explaining the FW spread for beef, the non-linear u-shaped trend remains highly significance in their presence.*"

Neither Brester nor *any* academic economist has requested the referenced econometric analyses mentioned in Taylor's footnote. Brester's assertions that Taylor's analyses "*lacks analytical rigor and represents a scientific failure*" is nothing more than pejorative speculation unworthy of inclusion in scholarly journals. In fact, it is the very sort of cacophony that drowns out the well-rehearsed symphony and is not allowed to remain in the hall during a performance by any audience. And academia is thought to demand more rigor than symphony patrons.

BMA built on Brester's (2006) assertion, "*... some have argued that decreases in FS statistics (and, by construction, increases in farm-to-retail marketing margins) are indicators of anti-competitive behavior in the food processing industry (Taylor, 2002; USDA, 2000).*" Neither Taylor nor USDA used the FS statistic as asserted. Both did use marketing margins; these are not the same thing as farmer share statistics. Over the years, USDA has issued numerous publications explaining marketing margins and how they should, or should not, be used. The focal ERS/USDA Briefing Room page on "price spreads" cautions users about these statistics.³ Brester and his co-authors surely know this. They know it is misleading to single out a single USDA outreach report to suggest that ERS economists don't understand price spreads.

BMA's attack employs a simple marketing margin theoretical model to discuss use and misuse of FS and margin data. This theoretical discussion is followed by empirical estimates of an econometric model for beef and pork. This model, according to Brester and his colleagues, states, "*empirically demonstrated that FS statistics and, by construction, farm-to-retail marketing margins, are not reliable measures of changes in producer surplus (welfare) given exogenous shocks to various economic factors.*"

³ <http://www.ers.usda.gov/Briefing/FoodMarketingSystem/pricespreads.htm>

This is a conclusion that is not reached through deduction proven within Brester's remarks. It is supported by no viable database, and certainly by none as vibrant as those seen and used by Taylor, and by the Pickett v Tyson jury.⁴

Brester's conclusion is wrong for several reasons. These are the most prominent ones. First, Brester's theoretical model does not introduce monopoly or monopsony power, or potential effects of captive supplies, which is a total disconnect with their empirical model that introduces, *ad hoc*, a proxy for market power. The most basic economic models imply that buyer power will increase margins (e.g. Beattie, Taylor and Watts, 2009, Ch. 6), and that marketing agreements with a base price tied to the residual cash market—the dominant captive arrangement—will widen margins further (e.g. Taylor, 2007a, 2007b).

Second, Brester and colleagues' empirical model of beef margins shows that beef packing concentration has a “*significant negative effect on cattle price*” and that “*Our econometric results imply that increases in the four-firm concentration ratio in the beef packing industry negatively affect the derived demand for cattle. p. 222.*”⁵ Third, Brester *et al*, apparently did not consider retail market concentration in their empirical model of retail beef price, even though an earlier study by Marsh and Brester (2004) found that retail concentration significantly increased the wholesale-to-retail margin for beef.

The point of Taylor (2002) and USDA (2000) was that the most plausible reason for increases in marketing margins was market power exertion. To the extent performed, empirical studies by BMA, Marsh and Brester actually provide support that the referenced studies were, in fact, reasonable.

Pickett v IBP/Tyson

Brester and BMA make a leap from the academic world to legislative and policy action, not only mischaracterizing *Pickett* but also presuming that their undisclosed evidentiary standards are appropriate to civil litigation. BMA claimed,

“... FS statistics (and farm-retail marketing margins) continue to be misused by economists ... in judicial proceedings, ... For example, reductions in the FS beef statistic (and associated increases in farm-wholesale beef marketing margins) was a focus of expert economic testimony for the plaintiffs in Pickett et al. v. Tyson Fresh Meats, Inc (2004) who sought damages allegedly caused by anti-competitive behavior in the beef packing industry. ... While the abuse of FS statistics and marketing margins transcends most agricultural commodities, the most publicized have occurred with respect to legislative and judicial actions related to the cattle and hog processing sectors.”

⁴ Had Brester read the trial record in Pickett he would know jurors were permitted to ask written questions, and used this power to pose mathematically expressed questions about high math, including statistics, to expert witnesses on both sides.

⁵ It is also worth noting that BMA inappropriately used supply side packer concentration statistics to measure buyer power. Given that fed cattle ready for slaughter cannot be economically hauled long distances, buyer power in the vicinity of packing plants is a more appropriate measure of buyer power than seller side statistics.

BMA asserted without reference to any legal document that the focus in *Pickett* was on margins. Jury Instruction #4 succinctly summarized the central economic allegation in *Pickett*,⁶

“4. That the defendant’s use of captive supply proximately caused the cash market price to be lower than it otherwise would have been?”

Experts testifying on behalf of Plaintiff cattlemen presented extensive econometric analyses of the relationship between captive supply and cash price. Plaintiff experts did not, as BMA claim, present *any* analyses of FS statistics, nor was the “focus of expert economic testimony” on margins.

As corroborating evidence, Plaintiffs experts did present analyses of the relationship between the monthly farm-to-wholesale marketing margin and captive supply as reported by USDA for the industry. Plaintiffs also presented extensive econometric analyses of Tyson’s weekly margins based on their own detailed internal managerial profit and loss statements for each plant. The Court admitted these analyses, but the trial record shows that margins were not the focus of Plaintiff’s expert testimony. Table 1 in Taylor’s initial report in *Pickett* (March 2000) summarized the estimated effect of captive supply on cash price and associated significance levels of 45 models estimated with GIPSA monthly data on captive supply, 32 models estimated with AMS weekly “additional movement” data, and 36 models estimated with Tyson’s weekly captive supply and cattle acquisition price data. Only 6 of these 103 models were estimated with margin data. Subsequent expert reports presented a hundred or so additional models.

Especially noteworthy in connection with BMA’s claim of misuse of margins is a WAEA selected paper on the effects of captive supply on farm-to-wholesale beef marketing co-authored by Ted Schroeder, who testified in *Pickett* on behalf of Tyson. In a paper presented only months before the *Pickett* trial, Pendell, Schroeder and Knoeber (2003) concluded,

“Conclusions from this study show acquisitions made by packers through forward contracts and marketing agreements had a small positive relationship with margins that were marginally statistically significantly different from zero (model 1) and statistically significant at the 5% level (model 2) ... This suggests that the small negative relationships found in previous studies between cash fed cattle prices and captive supply were apparently not all passed on to the wholesale market. p. 11.”

The above conclusion begs the question: Why did BMA make unfounded, undocumented allegations about misuse of margins by Plaintiffs’ expert when they could have cited a paper presented at the annual meeting of the association that publishes this journal, co-authored by a Co-Editor?

Evidence & Evidentiary Standard

⁶ *Pickett v Tyson Fresh Meats, Inc.*, Verdict Form, 2004.

Brester's criticism that he "*(has) yet to see this research meet peer-review criteria*" and BMA's criticism of use of margin data in "*legislative and judicial actions*" suggest that they want to impose their own standards, whatever they are, on judicial and legislative action. Such statements raise three pertinent questions. First, specifically what are peer review criteria? Second, are evidentiary standards the same for academic peer review and judicial actions? Third, what constitutes evidence in an academic setting compared to civil litigation?

In the same address criticizing Taylor's research for not meeting peer-review criteria, Brester offers his own assessment of peer review,

"Although the process is far from perfect, perhaps part of the problem is the assumption that the peer review process somehow results in the discovery of truth. We should admonish ourselves for such pretentiousness (p. 467)."

Litigation, unlike academic peer review, *is* indeed intended to discover the truth, although we readily acknowledge that our justice system is far from perfect. The typical peer review seems almost trivial compared to the intense scrutiny and cross-examination equivalent material goes through in support of major litigation. Some of the material Brester criticized as not having been "peer reviewed" and lacking "analytical rigor" received intense examination. Opposing counsel, clerks and experts intensely checked all data points, and econometric results. Plaintiff experts were deposed for days and thoroughly questioned by several of Tyson's lawyers accompanied by a PhD economist. One plaintiff expert—Taylor--was personally put on trial in what is known as a Daubert hearing, with Tyson's econometrician in attendance. Plaintiffs' experts were cross-examined for most of three days in front of a jury. Jurors even asked plaintiff experts statistical questions submitted through the Judge. Not much would be published in "peer-reviewed" journals if every manuscript had to go through such intense and exhaustive cross-examination.

BMA did not articulate the evidentiary standard they want to impose on litigation like *Pickett*, but it appears that they want to use classical statistical significance or something we call academic certainty. Daniel Rubinfeld, author of the Guide on Multiple Regression published in the Manual on Scientific Evidence for the Federal Judicial Council (FJC), states,⁷

"... I am convinced that if significance levels are to be used, it is inappropriate to set a fixed statistical standard irrespective of the substantive nature of the litigation." p. 1050

Levels of significance should be viewed as a continuum, not an absolute threshold. A high level of significance, say 95%, should be given greater evidentiary weight than say an 85% level of significance, but the later should not be summarily dismissed in legal proceedings just because it does not meet classical statistical cut-offs. Following Rubinfeld, plaintiff expert's summary of numerous statistical models reported and

⁷ See also Rubinfeld, 1985.

emphasized the estimated level of statistical significance so that the fact finder could judge whether a particular model met the legal standard.

In the FJC manual and other writings, Rubinfeld has emphasized the need for examining robustness of statistical models used in litigation.⁸ He has emphasized robustness of model specification as well as robustness over samples. The first Pickett report presented models estimated with Tyson's data covering Jan. 1994 through June 1999. Subsequent data covering July 1999 through October 2002 were used to test the expert's first estimate of effects of Tyson's captive supply on the price paid for slaughter cattle. Thus, Pickett experts considered robustness over model specification as well as samples. BMA presented a single model.

Whether BMA like it or not, legal standards appropriate to civil litigation are well established and are not based on classical statistical criteria or on peer review criteria or on academic views, but on law. As clearly stated in Pickett Jury Instruction No. 10,⁹

“It is appropriate at this time to define several terms which will recur from time to time in this charge. By a ‘preponderance of the evidence’ is meant that greater weight of credible evidence. Any party who has the burden of proving a claim must do so by the greater weight of the evidence. The greater weight of the evidence means evidence sufficient to make a claim more likely true than not true.”

In other words, the legal scales only have to tip ever so slightly to establish guilt or innocence. The legal standard appropriate to *Pickett* was simply “more likely than not.” This is fundamentally different from the implicit standard typically used by agricultural economists in reporting research results. Academic standards applied to new theories and analyses appear to come much closer to the legal standard used in murder trials--beyond a reasonable doubt--than to the preponderance of evidence standard used in *Pickett* and most other civil litigation.

In academic journals such as JARE, results from econometric models and theoretical arguments are often central evidence upon which conclusions are based. The Courts, however, often have a much broader concept of evidence. The Court's Jury Instructions in *Pickett* stated,

“You have heard the terms ‘direct evidence’ and ‘circumstantial evidence.’ You are instructed that you should not be concerned with those terms since the law makes no distinction between the weight to be given to direct and circumstantial evidence. ... The evidence from which you are to find the facts consists of the following: (1) the testimony of the witnesses; and (2) documents and other things received as exhibits.”

⁸ Daniel Rubinfeld, “Reference Guide on Multiple Regression,” Reference Manual on Scientific Evidence, Second Edition Federal Judicial Center, http://www.fjc.gov/library/fjc_catalog.nsf/autoframepage!openform&url=/library/fjc_catalog.nsf/DPublication!openform&parentunid=42E5BCA62EA1E03B85256CA30068A597

⁹ *Pickett v Tyson Fresh Meats, Inc.*, Court's Charge to the Jury, 2004.

Obviously the Courts have a much broader concept of evidence than do many peer-reviewed journals in agricultural economics. Academic journals like JARE are seemingly enamored with results from econometric models, almost to the complete exclusion of qualitative evidence, such as sworn statements by market participants on how market power and captive supplies are used to affect prices and other terms of trade.

Correlation v. Causation

Numerous academic studies have found a statistically significant negative relationship between captive supplies and cash price. Early studies presumed causation (Ward, 2002) until Schroeter and Azzam (1999) introduced a non-causal “price expectation” hypothesis supported by a complex econometric model based on estimates of *unobserved* price expectations inferred from their predictive model.

A key phrase in Jury Instruction #4 is, “*captive supply proximately caused.*” The Pickett court attempted to define this in Jury Instruction No. 10,

‘A proximate cause is one that in a natural course, in a continuous sequence, unbroken by any intervening cause, produces the injury, and without which the injury would not have occurred. This is not to say that the law recognizes only one proximate cause of an injury or damage, consisting of only one factor or thing, or the conduct of only one person. On the contrary, many factors or things, or the conduct of two or more persons, may operate at the same time, either independently or together, to cause injury or damage; and in such a case, each may be a proximate cause.’

The court’s instructions on proximate cause evidence is much different than what one infers from peer reviewed journals and public statements about whether captive supply violates the Packers & Stockyards Act.

General academic literature also takes a much broader view of causality than apparent from articles on captive supply authored by agricultural economists.

Difficulties of testing for causality with observational data are well recognized and documented in extensive academic literature (see, e.g., McKim and Turner (1997); Rubinfeld, (2000, p. 196). The recommended view of causality testing by Kaye and Freedman (2000) in the Statistics Chapter of the FJC Reference Manual on Scientific Evidence conclude,

“In the end, deciding whether associations are causal is not a matter of statistics, but a matter of good scientific judgment ...p. 352.”

Rubinfeld, in the FJC Chapter on Multiple Regression, states

“Causality cannot be inferred by data analysis alone; rather, one must infer that a causal relationship exists on the basis of an underlying causal theory that explains the relationship between two variables. Even when an appropriate theory has been identified, causality can never be inferred directly. One must also look for empirical evidence that there is a causal relationship. ... The reality that statistical

analysis generates probabilities that there are relationships should not be seen in itself as an argument against the use of statistical evidence. The only alternative might be to use less reliable anecdotal evidence. pp 184-185”

Two key elements of *Pickett* plaintiffs’ expert’s theory were: (a) captive agreements have a base price tied either to an announced USDA cash price the week before actual slaughter, or to an in-plant average price distorted Tyson’s buying incentives, thereby depressing price,¹⁰ and (b) preferential deals given to Tyson’s largest captive feeders led to supply response by those feeders, depressing cash price on the residual cash market.¹¹

Livestock economists recognized the inappropriate incentives inherent in market agreements in a 1999 study conducted for the National Cattlemen’s Beef Association (NCBA) by Purcell, et al. They stated,

“(NCBA should) Adopt a policy position opposed to contractual arrangements between cattle feeder/producer and packer when the base price is tied to a cash market in which the buying packer is active in buying fed cattle and/or when the base price is tied to plant or firm prices paid or cattle costs into the plant(s) for some time period prior to the date of delivery with the reasons for the policy position coming from the inappropriate incentives of this approach and from the need to restore integrity to the pricing system. pp. 63-64.”

BMA’s “theory” is that they have no theory; at least their theoretical model did not introduce either buyer power or captive supplies. Exclusion of basic economic incentives in the theoretical models presented by BMA and RTI suggest that they want to repeal the first and most basic law of economics, namely that incentives matter.

A convergence of legal concepts of causality with deeply philosophical views of statistical testing for causality is evident from the academic literature. As I. J. Good (1988a)¹² has noted in numerous publications, causality testing with observational data essentially comes down to the legal concept of the weight the evidence.¹³

Good (1988b) also maintains,

“Weights of evidence need not be at all precise to be useful. I believe that when a doctor, a detective or a cat smells a rat, he, she or it behaves as if she had made an implicit judgment of a weight of evidence in the technical sense. p. 409.”

¹⁰ Taylor (2007) gives a detailed theoretical and graphical treatment of how marketing agreements increase the farm-to-wholesale margin for a monopsonist.

¹¹ See also, Xia and Sexton (2004). A more subtle causality theory relates to how a large buyer can use captive supplies to affect the psychology of the cash market. In 1988, before Tyson (IBP) had captive supplies, the CEO articulated to cattlemen how captive supplies could be used to affect the psychology of the market and thus depress cash price.

¹² The referenced article includes numerous citations to his earlier work. He states, “I have discussed the topic of weight of evidence in over forty publications ...”

¹³ Also see articles and comments by other authors on “The Interface Between Statistics and Philosophy of Science” that accompany Good’s article.

To use Good's metaphor, a Jury is asked if, based on the weight of evidence, they smell a rat. If so, the defendant is guilty. Thus there are similarities between the legal concept of weighing evidence and common sense philosophical views of statistical causality testing; where academic discourse and the adversarial legal system may differ decidedly in what is considered evidence and the evidentiary standard used to weigh evidence.

Distorted incentives for large packer-buyers with marketing agreements has been widely recognized by many economists since the advent of the "formula" by Tyson's CEO, Bob Peterson, and Paul Engler, Tyson's largest supplier and Tyson executive before becoming a feeder. Briefly, about 80% of captive agreements have a base price tied either to an announced USDA cash price the week before actual slaughter, or to an in-plant average price. For a big buyer this obviously distorts buying incentives, increasing the marginal cost of buying on the cash market.

Bruce Bass, Head buyer for Tyson, testified that when captive commitments were high that he "set" a lower price for field buyers to offer on the cash market.¹⁴ A jury could plausibly interpret such admissions by Tyson executives as evidence of cause and effect.

Many livestock economists as well as peer-reviewed journals have seemingly turned a blind eye to substantive non-quantitative evidence supporting causality, such as that alluded to above, in favor of a complex expectation hypothesis that is only "suggestive" of non-causation. Juries are instructed to weigh "all" the evidence. Perhaps academics and policy makers need the same instructions given juries. At the very least, academics should realize that,

*"Statistics and law may use the same words quite differently, creating a significant possibility of miscommunication. A partial list of such words ... include reliable, valid, significant, power, and causation."*¹⁵

We rest our case.

¹⁴ *Pickett v Tyson Fresh Meats, Inc.*, Testimony of Bruce Bass, Trial Transcript, 3010:19 through 3021:4, Feb. 5, 2004.

¹⁵ Willborn (2005), p.31.

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