United States – Certain Country of Origin Labelling (COOL) Requirements:

Recourse by the United States to Article 22.6 of the DSU (Canada) **(DS384)**

Recourse by the United States to Article 22.6 of the DSU (Mexico) **(DS386)**

Responses of
the United States of America
to the Arbitrators' Questions to the Parties

September 1, 2015

EXHIBIT LIST

Exhibit US-48	Damodar N. Gujarati, *Basic Econometrics*, Fourth Edition, McGraw-Hill Irwin (2004)
Exhibit US-49	Joao E. Mutondo, B. Wade Brorsen, & Shida R. Henneberry, *Welfare Impacts of BSE-Driven Trade Bans,* Ag. and Resource Econ. Review, 38/3 (Dec. 2009)
Exhibit US-50	Xueyan Zhao, J.D. Mullen, G.R. Griffith, W.E. Giffiths, & R.R. Piggott, *An Equilibrium Displacement Model of the Australian Beef Industry,* Economic Research Report No. 4 (Dec. 2000)
Exhibit US-51	Market Share Data

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Short Form	Full Citation
Canada – Aircraft (Article 21.5 – Brazil) (AB)	Appellate Body Report, *Canada – Measures Affecting the Export of Civilian Aircraft – Recourse by Brazil to Article 21.5 of the DSU*, WT/DS70/AB/RW, adopted 4 August 2000
EC – Bananas III (US) (Article 22.6 – EC)	Decision by the Arbitrators, *European Communities – Regime for the Importation, Sale and Distribution of Bananas – Recourse to Arbitration by the European Communities under Article 22.6 of the DSU*, WT/DS27/ARB, 9 April 1999
EC – Hormones (Canada) (Article 22.6 – EC)	Decision by the Arbitrators, *European Communities – Measures Concerning Meat and Meat Products (Hormones). Original Complainant by Canada – Recourse to Arbitration by the European Communities under Article 22.6 of the DSU*, WT/DS48/ARB, 12 July 1999
EC – Hormones (US) (Article 22.6 – EC)	Decision by the Arbitrators, *European Communities – Measures Concerning Meat and Meat Products (Hormones), Original Complaint by the United States – Recourse to Arbitration by the European Communities under Article 22.6 of the DSU*, WT/DS26/ARB, 12 July 1999
US – COOL (Article 21.5) (Panel)	Reports of the Panel, *United States – Certain Country of Origin Labelling (COOL) Requirements – Recourse to Article 21.5 of the DSU by Canada and Mexico*, WT/DS384/RW, WT/DS386/RW, adopted 29 May 2015
US – COOL (AB)	Appellate Body Reports, *United States – Certain Country of Origin Labelling (COOL) Requirements*, WT/DS384/AB/R / WT/DS386/AB/R, adopted 23 July 2012
US – COOL (Panel)	Panel Reports, *United States – Certain Country of Origin Labelling (COOL) Requirements*, WT/DS384/R / WT/DS386/R, adopted 23 July 2012, as modified by Appellate Body Reports WT/DS384/AB/R / WT/DS386/AB/R

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US – Gambling *(Article 22.6 – US)*	Decision by the Arbitrator, *United States – Measures Affecting the Cross-Border Supply of Gambling and Betting Services – Recourse to Arbitration by the United States under Article 22.6 of the DSU*, WT/DS285/ARB, 21 December 2007
US – Gambling (AB)	Appellate Body Report, *United States – Measures Affecting the Cross-Border Supply of Gambling and Betting Services*, WT/DS285/AB/R, adopted 20 April 2005
US – Tuna II (Mexico) (AB)	Appellate Body Report, *United States – Measures Concerning the Importation, Marketing and Sale of Tuna and Tuna Products*, WT/DS381/AB/R, adopted 13 June 2012
US – Upland Cotton *(Article 22.6 – US II)*	Decision by the Arbitrator, *United States – Subsidies on Upland Cotton – Recourse to Arbitration by the United States under Article 22.6 of the DSU and Article 7.10 of the SCM Agreement*, WT/DS267/ARB/2 and Corr.1, 31 August 2009
US – Wool Shirts and Blouses (AB)	Appellate Body Report, *United States – Measure Affecting Imports of Woven Wool Shirts and Blouses from India*, WT/DS33/AB/R, adopted 23 May 1997, and Corr. 1

1.   <u>GENERAL QUESTIONS</u>

1.   *All parties*: (a) In arbitration proceedings under Article 22.6 of the DSU, is the
objecting party required to present alternative calculations under the methodology
proposed by the requesting party? (b) Could the parties comment on the role of the
United States' proposed alternative methodology in establishing its *prima facie* case?

1.   In an arbitration proceeding under Article 22.6, the objecting party has the burden of
proving that the requesting party's proposal is inconsistent with Article 22.4.[1] For purposes here,
what that means is that it is up to the United States "to submit arguments and evidence" that the
level of suspension proposed by the requesting party "is not equivalent to the level of
nullification and impairment" caused by the COOL measure.[2] There is no requirement in the
text of Article 22 on what this "evidence and argument" must be in order to establish its *prima
facie* case.

2.   Once the objecting party has shown that the level of suspension requested by the
complaining party is in excess of the level that is equivalent to the level of nullification or
impairment, then the objecting party has met its burden of proof. There is no additional burden
on the objecting party with respect to establishing what would be an equivalent level of
suspension. Furthermore, there is no presumption that any of the calculations or assertions of a
requesting party is accurate and there is no burden on the objecting party to "overcome" or rebut
any such calculation or assertion. Instead, each party must prove the facts that it asserts are true.[3]

3.   Rather, "past arbitrators have also considered that, if they determined that the proposed
level is not equivalent to the level of nullification or impairment as required by the DSU, then it
was also their duty to estimate the level of suspension that they considered to be equivalent to the
impairment suffered, with a view to contributing to the objective of prompt and positive
settlement of disputes embodied in the DSU."[4]

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[1] *EC – Hormones (US) (Article 22.6 – EC)*, para. 9.

[2] *EC – Hormones (US) (Article 22.6 – EC)*, para. 9 ("Following well-established WTO jurisprudence, this
means that it is for the EC to submit arguments and evidence sufficient to establish a *prima facie case* or
presumption that the level of suspension proposed by the US is not equivalent to the level of nullification and
impairment caused by the EC hormone ban."); *see also See US – Gambling (AB)*, para. 140; *US – Wool Shirts and
Blouses (AB)*, at 16.

[3] *EC – Hormones (US) (Article 22.6 – EC)*, para. 10 ("It is for the party alleging the fact to prove its
existence."); *see also US – Tuna II (Mexico) (AB)*, para. 283 ("[I]t is important to distinguish, on the one hand, the
principle that the complainant must establish a *prima facie* case of inconsistency with a provision of a covered
agreement from, on the other hand, the principle that the party that asserts a fact is responsible for providing proof
thereof.") (quoting *Japan – Apples (AB)*, para. 157); *Canada – Aircraft (Article 21.5 – Brazil) (AB)*, para. 50 ("[T]he
burden of explaining the relevance of evidence, in proving claims made, naturally rests on whoever presents that
evidence.").

[4] *US – Gambling (Article 22.6 – Antigua)*, para. 2.8, citing to "Decision by the arbitrators, *EC – Hormones*,
para. 12. *See* also decision by the arbitrators, *EC – Bananas III (Ecuador) (Article 22.6 – EC)*, (request by Ecuador),
paras. 171-173 and *US – 1916 Act (EC) (Article 22.6 – US)*, paras. 4.6-4.8, which cites the relevant passages of
earlier decisions."

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4.   Here, the United States has established its *prima facie* case in three different, and independent ways, bearing in mind that past arbitrators, in determining whether the level of suspension requested is equivalent to the level of nullification or impairment, have first sought to determine the level of nullification or impairment.

5.   First, the United States has provided a methodology – the equilibrium displacement model (EDM) – that more accurately estimates the level of nullification and impairment than the one proposed by the requesting parties. The United States has explained why the econometric model proposed by Canada and Mexico is not an accurate methodology for estimating the level of nullification and impairment in this proceeding, and the United States has explained why the EDM is a more accurate approach. Furthermore, as discussed, estimates of the levels of nullification and impairment resulting from the EDM are far lower than the levels proposed by Canada and Mexico. These results from a more accurate approach demonstrate that the levels of suspension requested by Canada and Mexico are not equivalent to the levels of nullification and impairment. As a result, the United States has satisfied its burden of proof.

6.   Second, the United States has explained why, even aside from the EDM approach, the somewhat differing econometric calculations of the requesting parties produce highly inflated levels of nullification and impairment. In this regard, the United States has shown that the calculations are significantly flawed regarding the trade in Canadian and Mexican livestock that would occur in the absence of the amended COOL measure. As a result, the levels of suspension requested by Canada and Mexico are not equivalent to the levels of nullification and impairment. Again, on this basis alone, the United States has satisfied its burden of proof.

7.   Third, the United States has explained why the requesting parties' claims for non-trade related damages – *i.e.*, their claims regarding domestic "price suppression losses" – are legally invalid. For this reason alone as well, the requested levels of suspension are not equivalent to the levels of nullification and impairment, and the United States has satisfied its burden of proof.

8.   As the levels of suspension requested are not equivalent to the levels of nullification and impairment, the United States respectfully requests that the Arbitrators determine the levels of suspension that would be equivalent to the levels of nullification and impairment, as past arbitrators have done.[5] In this regard, the results of the EDM are a more accurate and appropriate calculation than the econometric calculations of the requesting parties.

2.   *All parties*: **What are the consequences if a requesting party does not fulfil the requirement "to come forward with evidence explaining how it arrived at its**

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[5] *See, e.g., EC – Hormones (Article 22.6 – EC)*, para. 12; *US – Gambling (Article 22.6 – US)*, para. 2.8 ("This means that it is necessary to determine what this level of nullification or impairment of benefits is, in order to compare it to the requested level of suspension. Further, past arbitrators have also considered that, if they determined that the proposed level is not equivalent to the level of nullification or impairment as required by the DSU, then it was also their duty to estimate the level of suspension that they considered to be equivalent to the impairment suffered, with a view to contributing to the objective of prompt and positive settlement of disputes embodied in the DSU. *This is also what the United States is asking the Arbitrator to do in this dispute.*" (emphasis added, footnotes omitted)).

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proposal and showing why its proposal is equivalent to the trade impairment it has suffered"?[6]

9.   The consequences would be twofold.

10.   First, where the objecting party has established a *prima facie* case that the level of suspension proposed by the requesting party is not equivalent to the level of nullification and impairment, then it is up to the requesting party to submit "arguments and evidence sufficient to rebut that presumption."[7] Where the requesting party has failed to provide sufficient evidence that "explain[s] how it arrived at its proposal," the requesting party would fail to rebut the objecting party's *prima facie* case.

11.   Second, as noted above, it is also well-established that, regardless of who bears the burden of proof, all parties must prove the facts that they assert are true. If a requesting party has failed to provide evidence that supports its allegation that its proposal is "equivalent" to the trade impairment, the arbitrator may not rely on such allegations in estimating the level of suspension that the arbitrator considers to be equivalent to the level of nullification or impairment. The failure by a requesting party to adduce sufficient evidence and argument to support its propose methodology and request would itself support the objecting party's *prima facie* case that the request is not equivalent to the nullification or impairment.

3.   *All parties*: If the parties make opposing assertions on the same fact (e.g., regarding the impact of feed costs), is the Arbitrator to consider this a situation where the evidence is in equipoise, with the consequence that the requesting party would prevail?[8]

12.   No. As an initial matter, the United States would note that simply because the parties make opposing assertions on the same fact that does not mean "the evidence is in equipoise." One party may well have the more persuasive evidence and the more persuasive argument that its viewpoint is the correct one. Indeed, the parties have taken opposing viewpoints on any number of facts throughout this dispute and the preceding two panels have been able to make factual findings based on the record evidence without simply defaulting to which party has the burden of proof.

13.   But more fundamentally, it is important to distinguish between the burden of proof with respect to a claim, and that with respect to a fact (such as the impact of feed costs).

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[6] Decision by the Arbitrators, *EC – Hormones (US) (Article 22.6 – EC)*, para. 11. (emphasis original) *See also* Decisions by the Arbitrators, *US – 1916 Act (EC) (Article 22.6 – US)*, para. 3.6; *US – Gambling (Article 22.6 – US)*, paras. 2.24-2.25 and footnote 28.

[7] *EC – Hormones (US) (Article 22.6 – EC)*, para. 9.

[8] *See* Decision by the Arbitrators, *EC – Hormones (US) (Article 22.6 – EC)*, para. 9. *See also* Decision by the Arbitrators, *Brazil – Aircraft (Article 22.6 – Brazil)*, para. 2.8.

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14.　　The claim at issue in these proceedings is that the level of suspension requested is not equivalent to the level of nullification or impairment. As the arbitrator explained in *EC – Hormones (US) (Article 22.6 – EC)*, "it is for the [objecting party] to submit arguments and evidence sufficient to establish a *prima facie* case or presumption that the level of suspension proposed … is *not* equivalent to the level of nullification and impairment caused by the [measure at issue]. Once the [objecting party] has done so, however, it is for the [requesting party] to submit arguments and evidence sufficient to rebut that presumption. Should all arguments and evidence remain in equipoise, . . . the party bearing the original burden of proof, would lose."[9]

15.　　However, for *facts*, as explained above, it is up to the party asserting a fact to establish its existence. As the *Hormones* arbitrator explained: "[t]he same rules apply where the existence of a specific *fact* is alleged; in this case, for example, where a party relies on a decrease of beef consumption in the EC or the use of edible beef offal as pet food. It is for the party alleging the fact to prove its existence."[10]

4.　　*United States*: The United States alleges that econometric modelling is "fundamentally unsuited to determining the impact of the amended COOL measure in a market influenced by a wide variety of competing factors."[11] Please explain why econometric analysis is fundamentally unsuited in the context of this Article 22.6 arbitration as compared with prior stages of the proceedings.

16.　　Not all analytical tools – economic or otherwise – are appropriate for "solving" or providing insight with respect to all potential questions. Some modeling techniques, equations, or other devices may be better suited than others to resolving with accuracy particular questions. As described in detail in Question 25, the complexity of the livestock market, the concurrent variables affecting price and quantity, the available data with respect to unrelated variables, and other significant specification issues render econometric modeling inaccurate for the purposes of determining the specific level of nullification or impairment attributable to the amended COOL measure. It is simply not the right analytical tool for this particular problem.

An Article 22.6 Arbitration Asks a Distinct Question from that Asked in Previous Proceedings

17.　　In previous proceedings, the panels considered whether the challenged measure results in a detrimental impact on complainants' livestock exports. That is, the question before those panels was whether or not the COOL measure caused such a detrimental impact, or if other variables (including the economic recession, BSE, feed costs, drought, etc.) instead explained the

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　　[9] *EC – Hormones (US) (Article 22.6 – EC)*, para. 9. The "equipoise" case is an extreme case that has yet to occur and does not occur here in light of the arguments and evidence that the United States has put forward.

　　[10] *EC – Hormones (US) (Article 22.6 – EC)*, para. 10.

　　[11] U.S. Written 22.6 Submission (Canada), para. 114; U.S. Written 22.6 Submission (Mexico), para. 87.

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negative impact on complainants' exports.[12] This was in essence a binary determination – detrimental impact either occurred or did not occur.[13]

18.   However, an Article 22.6 arbitration asks a different question. The task of the arbitrator is to determine if the requested level of suspension of concessions is equivalent to the level of nullification or impairment of benefits accruing to the complaining Member.[14] As prior Article 22.6 arbitrators have noted, arbitrators are "called upon to go further," than panels.[15] That is, "the essential task and responsibility conferred on the arbitrator in order to settle the dispute," is "to estimate the level of suspension [the arbitrator] consider[s] to be equivalent to the impairment suffered."[16] This analysis calls for a level of precision and accuracy, and stands in contrast to the binary analysis of the panels and Appellate Body of Canada's econometric evidence.[17] While econometrics is one tool that can be used to answer the question of whether or not a measure has a trade effect (*i.e.*, if a variable is statistically significant), it is not sufficient to accurately answer the question before the Arbitrator for purposes of this proceeding regarding the level of trade loss caused by the amended COOL measure.

Econometric Analysis is Not the Correct Methodology for Determining the Level of Nullification or Impairment in this Proceeding

19.   As the United States has explained, econometrics has not been used for any other Article 22.6 arbitration to determine the appropriate level of countermeasures.[18] This is because econometrics, while a useful tool in certain instances, is not well suited to isolating and meaningfully quantifying the effects of a particular measure in the context of the complex cross-border trade.

20.   In this case and for this market, econometrics is a much more complex and difficult methodology to apply than a partial equilibrium model. Econometrics must identify all relevant factors that have affected supply and price to isolate the relevant effect – and must have the relevant data as well. Partial equilibrium modeling, in contrast, takes a current year (in this case

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[12] We note that only Canada used econometrics to make this argument. Mexico did not provide an econometric analysis of COOL until the Article 22.6 arbitration stage of the dispute.

[13] For instance, the panels in *US – COOL* noted that "it is not our task to establish a unified econometric report or to conduct our own econometric assessment," *US – COOL (Panel)*, para. 7.539, rather it used the econometric studies to determine whether "the COOL measure negatively and significantly affected the import shares and price basis of Canadian livestock." *Id.*, para. 7.542.

[14] DSU, Article 22.7 (emphasis added).

[15] *EC – Hormones (US) (Article 22.6 – EC)*, para. 12.

[16] *EC – Hormones (US) (Article 22.6 – EC)*, para. 12.

[17] *See US – COOL (Panel)*, para. 7.449 ("[P]anels are not arbitrators and arbitrators are not panels. . . . Panels and Article 22.6 arbitrators operate on the basis of different procedures and legal provisions, and at different stages of WTO dispute settlement.").

[18] U.S. Written 22.6 Submission (Canada), para. 32. Conversely, equilibrium displacement modeling has been utilized to estimate the impact of impermissible measures. *Id.*

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2014) and only removes the negative impact of the measure (in this case the COOL "wedge"). In partial equilibrium modeling, the debate is over the parameter estimates and the wedge, where in an econometric modeling, the debate is over every single variable (included or omitted).

21.   And the debate over the Canadian and Mexican econometric modeling parallels that broader debate. In fact, neither requesting party suggests that their calculations account or control for all of the relevant factors in any effective way which would permit the isolation of the COOL measure's effect.[19] Instead they claim – without sufficient explanation – that the other variables that logically affect price and quantity in the North American livestock market do not meet vaguely described criteria.[20] For instance, with respect to the recession, Canada notes that it finds the variable to have "no significant impact on the coefficient of interest," with no explanation as to how it reached this conclusion or what data was used to explore this issue.[21] Further, Canada indicates in other cases that the variable is not included due to lack of data, rather than any principled assessment of its explanatory power.[22]

22.   Nor do the studies or analyses the requesting parties cite attempt to provide a similar degree of certainty as to the monetary impact of a particular policy.[23] Moreover, other studies

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[19] *See, e.g.*, Canada Written 22.6 Submission, para. 31; Mexico's Written 22.6 Submission, paras. 15-18.

[20] Canada indicates that the variables can only be included if there are "strong economic reasons," they are "clearly exogenous," and not "temporally correlated." Canada's Written 22.6 Submission, para. 38. Canada does not however explain why the suggested variables cannot be included in these terms. For instance, with respect to the recession, it notes that it finds the variable to have "no significant impact on the coefficient of interest," with no explanation as to how it reached this conclusion or what data was used to explore this issue. *Id.*, para 40. Further, it indicates in other cases that the variable is not included due to lack of data, rather than any principled assessment of its explanatory power. *Id.*, para. 44.

[21] Canada's Written 22.6 Submission, para 40. Moreover, Canada asserts that there is no evidence of a differential impact of the recession on the United States and Canada, though this is well-accepted in the academic literature. *See, e.g.*, D. Sumner and S. Pouliot, *Differential impacts of country of origin labeling: COOL econometric evidence from cattle markets*, Food Policy, 49: 107-116 (2014), 111 (Exhibit US-35) (hereinafter, Sumner and Pouliot (2014)).

[22] Canada's Written 22.6 Submission, para. 44. Similarly, Mexico claims that because it has utilized Ordinary Least Squares (OLS) regressions, only exogenous variables that have a causal impact should be included as explanatory variables, and that an omitted variable will only create a bias if that omitted variable is correlated with the variable of interest. This explanation does nothing to clarify why the variables cited were not included in Mexico's analysis. Mexico's Written 22.6 Submission, para. 16.

[23] Each peer-reviewed article is an example of the general utility of econometric analysis, but these analyses do not isolate the cost (or forgone benefit) resulting from a particular policy within larger economic systems. Moreover, in many instances they provide a more sophisticated econometric analysis than that provided here. *See e.g.*, J. Mullin & P. Bharadwaj, *Effects of Short-Term Measures to Curb Air Pollution: Evidence from Santiago Chile*, 97 Am. J. Ag. Econ. 1107 (2015) (analyzing impact of air pollution policy change in terms of measured "particulate matter" and deaths, but noting inability to "disentangle the effects of behavioral responses to pollution alerts,") (CDA-44 (22.6)); H. Storm, K. Mittenzwei and T. Heckelei, *Direct Payments, Spatial Competition, and Farm Survival in Norway*, 97 Am. J. Ag. Econ. 1192 (2015) (assessing the probability of survival of farms where neighboring farms receive direct payments, and drawing conclusion regarding assumptions about independent farm behavior) (CDA-45 (22.6)); R. Thomson, *The Yield of Plant Variety Protection*, 97 Am. J. Ag. Econ. 762 (2015) (describing the productiveness of certain new varieties of wheat as compared to incumbent varieties) (CDA-47 (22.6)); J. Grant, Is the Growth of Regionalism as Significant as the Headlines Suggest? Lessons

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Canada cites discuss significant concerns with robustness and omitted variables.[24] Further, this is particularly apparent in this arbitration given that neither Canada nor Mexico were able to uniformly use econometrics for all elements of their analysis. For instance, Canada was unable to use econometrics to predict the effect on Canadian feeder prices, if COOL were removed, and Mexico was unable to use econometrics to predict export quantities of feeder cattle, if COOL were removed. In contrast, partial equilibrium models can be used to evaluate all aspects of the market effects (supply, demand, prices) on agricultural commodities and do not require a "piecemeal" approach required under an econometric approach.

23.   It is no surprise, therefore, that other Article 22.6 arbitrators have relied on partial equilibrium models, including most recently in *US – Upland Cotton*,[25] and not econometric modeling. In *US – Upland Cotton*, Dr. Sumner utilized a partial equilibrium model that sought to quantify the price effect of U.S. measures in support of upland cotton.[26] In that model, Dr. Sumner seeks to determine "but for" U.S. cotton subsidies, what would the world cotton price be? This question – what would the level of prices (or trade) be "but for" the WTO-inconsistent measure – has been the basis for determining the appropriate level of countermeasures in previous Article 22.6 arbitrations, and in several of these arbitrations, the trade effect was measured using a partial equilibrium framework such as the EDM.

24.   As the United States has explained, the EDM has been used in numerous peer-reviewed academic studies of COOL, as well as more generally for the livestock and other agricultural sectors in the United States and other countries.[27] In fact, Dr. Sumner has used an EDM on more

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from Agricultural Trade, J. of Int'l and Econ. Law, 44 (2013) (investigating regional trade agreements through a gravity model with log-normal error term, and discounting the utility of ordinary least squares modeling approach) (CDA-47 (22.6)).

[24] S. Baier and J. Bergstrand, Estimating the Effects of Free Trade Agreements on International Trade Flows Using Matching Econometrics, J. of Int'l Econ, Vo. 77 (1) (2009), 63-76 (discussing a number of potential methods for estimating effects of free trade agreements, but discounting ordinary least squares approach) (Exhibit CDA-42); J. Swinnen, A. Olper, and T. Vandemoortele, Impacts of the WTO on Agricultural Food Policies, World Economy, Vol. 35, (2012), 1089-1101 (econometrically estimating impact of food policies, and citing concerns regarding potential endogeneity bias caused by omitted policy factors that are correlated with the WTO dummy and the error term, but which are difficult to observe) (Exhibit CDA-43).

[25] *US – Upland Cotton (Article 22.6 – US II)*, para. 4.2 (describing the "Sumner Model"), para. 4.130 ("Brazil's log-linear displacement model can be used to estimate the amount of countermeasures that Brazil is entitled to for the failure of the United States to comply with the ruling to remove the adverse effects of its marketing loans and countercyclical payments.").

[26] *US – Upland Cotton (Article 22.6 – US II)*, para. 4.2 ("To quantify [the price and supply] effects [of the measure], Brazil relies on a partial equilibrium model already referred to in the compliance proceedings, the 'Sumner model'."). The United States concurred that a partial equilibrium model was appropriate. *Id.*, para. 4.132 ("Second, the United States has in fact employed the model, using its own set of parameters and reference period, to calculate what the United States believes is the amount of countermeasures Brazil is entitled to. Further, the United States does not provide its own simulation model which could be employed to calculate the amount of countermeasures.").

[27] U.S. Written 22.6 Submission (Canada), para. 32, U.S. Written 22.6 Submission (Mexico), para. 32.

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than one occasion to analyze policy effects on agricultural markets.[28] In many of these studies, the EDM has been employed to answer the type of question before the Arbitrator: what is the quantitative effect of COOL on trade?[29] The EDM and other partial equilibrium ("PE") models are widely used for this type of analysis because they allow for the use of actual data,[30] and describe the adjustment to supply and demand (and therefore prices), that would result from a change in policy, such as the removal or modification of a measure such as COOL.

25.   As described in response to question 25, econometric analysis simply cannot capture all of the important parameters in the integrated live animal and meat sector in North America in such a way that isolates the effect of the amended COOL measure. There are too many other factors that affect trade in this sector, and no way to accurately estimate and adequately control for these variables.[31] As such, the econometric analysis of the amended COOL measure is fundamentally unsuited in the context of these Article 22.6 arbitrations as compared with prior stages of the proceedings.

2   QUESTIONS ON THE METHODOLOGIES PROPOSED BY CANADA AND MEXICO

2.1   Export Revenue Loss

5.   *All parties*: **Please comment on the implications of using price basis rather than actual price to estimate export revenue losses, with particular regard to the arguments and issues set out below:**

   a.   *United States*: **The United States submits that Canada and Mexico could have used prices in absolute terms rather than price bases.[32] The United States also appears to challenge the fact that Canada's methodology in previous proceedings relied on relative quantity impact but now addresses absolute quantities.[33] Does the United States contend that use of prices in absolute**

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[28] *See e.g.*, J.V. Balagtas, F.M. Hutchinson, J.M. Krochta, and D.A. Sumner, *Anticipating market effects of new uses for whey and evaluating returns to research and development*, 86 J. DAIRY SCI. 1662-1672 (2003) (Exhibit US-9); Bradley J. Rickard & Daniel A. Sumner, *Domestic support and border measures for processed horticultural products*, AM. J. OF AGRIC. ECON. 90(1), 55-68 (Feb. 2008) (Exhibit US-10); Daniel A. Sumner & Michael K. Wohlgenant, *Effects of an increase in the federal excise tax on cigarettes*, AM. J. OF AGRIC. ECON. 67(2), 235-242 (May 1985) (Exhibit US-11).

[29] *See* U.S. Written 22.6 Submission (Canada), para. 31, U.S. Written 22.6 Submission (Mexico), para. 31.

[30] Canada suggests that the econometric model is superior because it utilizes "actual data," but the EDM also uses actual data as the basis of its analysis. *See* Exhibit US-3.

[31] U.S. Written 22.6 Submission (Canada), para. 31; U.S. Written 22.6 Submission (Mexico), para. 31.

[32] U.S. Written 22.6 Submission (Canada), para. 104; U.S. Written 22.6 Submission (Mexico), para. 75 (If Canada's and Mexico's "export equations had all the proper exogenous variables then [they] could have used those same exogenous variables to explain the [effect on Canadian and Mexican] prices directly rather than just through a price basis analysis.").

[33] U.S. Written 22.6 Submission (Canada), para. 94.

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terms is more appropriate and/or accurate for the estimation of export revenue losses? Is it the United States' position that the methodologies proposed by Canada and Mexico should estimate quantity impacts in relative rather than absolute terms to calculate export revenue losses?

26.　　Rather than focus on the actual price of livestock, Canada and Mexico both utilize equations specified in terms of "price basis." Canada interprets the estimated coefficients of the amended COOL measure in the price basis equations as a loss in the price in Canada[34] and ignores the positive impact of the amended COOL measure on U.S. price included in the change in the price basis.

27.　　The flaw with this equation specification is that the estimation of trade effects should measure how much the amended COOL measure impacts or lowers Canadian and Mexican livestock prices. Thus, changes to the price basis, which addresses changes in both the U.S. and Canada or Mexico export prices, is not appropriate because the widening basis captures both the decline in Canada or Mexico export prices and the increase in the U.S. price.

28.　　Moreover, the price in absolute terms and the price basis are not equivalent measures. As Pouliot and Sumner demonstrated in their academic work related to COOL, the basis change is larger than the exporting country's price decline.[35] Using the price basis for determining the actual trade impact of COOL will overstate the price effect.

29.　　For these reasons, even under the econometric approach advocated by Canada and Mexico, one would need to use prices in absolute terms rather than price bases as the dependent variable to determine the impact of COOL on export prices for the estimation of export revenue losses. By using the price basis as the dependent variable in their model specification, Canada and Mexico estimate the combined effect of COOL on U.S. prices *and* Canadian or Mexican export prices which further results in an overstated, inaccurate calculation of the export revenue loss.

30.　　Finally, with respect to whether quantity should be estimated as an absolute value or ratio, using a quantity dependent variable instead of a ratio can provide an answer to the question of whether there is there a statistically significant COOL impact on traded volumes (but as explained above, an econometric approach here would not provide an accurate answer as to how much of an impact). However, the equation that Canada uses does not include all the relevant explanatory variables. In addition, the data manipulation efforts to convert monthly data into weekly data in order to estimate the equations also introduce measurement errors that result in biased estimates.

31.　　Canada's quantity model is thus mis-specified and does not adequately provide unbiased estimates to answer the question, "how much has COOL impacted traded volumes?" As

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[34] Canada's Methodology Paper, paras. 50, 212-217.

[35] Sumner and Pouliot (2014), at 110 (Exhibit US-35).

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illustrated by Canada's previous references to the ratio of imports, Canada is not the only supplier of livestock to the United States. Increases or decreases in livestock inventory in Mexico will have an impact on Canadian suppliers. Thus to measure these quantitative effects, a model must account for other suppliers. The EDM model is the appropriate method for addressing these supply issues.

  b.   ***Canada*: Canada states in its written submission that it is necessary to estimate the actual amount of lost exports, not the relative amount.[36] In the following paragraph, Canada states that the use of a price basis specification (rather than a specification based on actual export price) "allows one to capture parsimoniously the impacts of a host of variables that may affect livestock prices in both countries in a similar way."[37] Please explain the justification for using prices in relative terms while using export quantities in absolute terms in estimating export revenue losses.**

  c.   ***Mexico*: Mexico states that the use of price basis rather than price has substantial explanatory value.[38] Additionally, the domestic price suppression is computed as the product of the estimated change in the price basis and the long run transmission of the export price to the domestic price, which is estimated from a price transmission equation. Would it be possible to estimate Mexico's lost export revenues by specifying the dependent variable as the actual price, and to address the issue of the unit root characterizing the price of Mexican imported feeder cattle exported to the United States?**

6.   *All parties*: What are the implications of using export prices from the exporting country, as opposed to export prices within the destination country, for the interpretation, results, and accuracy of estimating price basis impact?

32.   We understand this question to inquire as to the implications for interpretation, results and accuracy of using data reflecting prices in the domestic market of the exporting country (i.e., prices in Canada or Mexico), as opposed to import prices (i.e., prices of the livestock at the border after clearing customs when imported into the United States), when estimating the price basis impact. As a preliminary point, as described above, the United States notes that the reliance on the basis is misplaced, and one should consider changes in the absolute price.

33.   Canada and Mexico have used an assortment of data sources for their econometric analysis, rather than using a consistent set of data. Canada utilizes Canadian domestic pricing

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[36] Canada's Written 22.6 Submission, para. 34 ("In arriving at the level of nullification or impairment that the COOL requirements are causing to Canada, one must estimate the amount of the lost export quantity, not a relative loss.")

[37] Canada's Written 22.6 Submission, para. 35.

[38] Mexico's Written 22.6 Submission, para. 45.

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data,[39] while Mexico utilizes pricing data sourced in the United States (these data sources report prices in the domestic market of the United States).[40] Canada also uses [[

]].[41] With respect to quantity data, Canada utilizes unverified Animal and Plant Health Inspection Service (APHIS) data of quantities imported into the United States,[42] while Mexico utilities U.S. Census data for its quantity estimates.[43] Conversely, the U.S. EDM consistently relies on import statistics maintained by the U.S. Census Bureau,[44] which is the official source for U.S. trade data, for both price and quantity.[45]

34.　　As a preliminary point, as described in the U.S. submission, the data used by the requesting parties is unverified and contains inaccuracies. For instance, Canada uses unverified APHIS data for quantity determinations. This data is collected for animal health purposes and is not verified or corrected, and, as a result, does not match the official monthly import statistics.[46] Mexico uses the weekly export price data that AMS Marketing News reports, which are localized, based on particular auction transactions, and do not reflect the full range of prices received for Mexican cattle.[47] The official U.S. import statistics represent the most consistent and verified source of data.

35.　　Whether the data used is from the domestic market of the exporting country or from the point at which the livestock enter the importing country is relevant to the accuracy of the price and quantity basis determinations – as well as the relation of the price and quantity basis determinations. In theory, the price basis comparison – and analysis of whether the basis is widening – should rely on "apples to apples" comparisons, so as to ensure that the basis change does not reflect other relevant factors influencing the price differential. This means that, rather than deny the existence or relevance of numerous other explanatory variables, the econometric modeling should be addressing and controlling for substantive factors – including as they exist in particular data sets. But Canada and Mexico's refusal to address issues, such as transportation

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[39] *See* Exhibits CDA-26, CDA-27, and CDA-33.

[40] *See* MEX Appendix-2.

[41] Exhibit CDA-20.

[42] Exhibits CDA-22, CDA-28.

[43] MEX Appendix-16.

[44] The U.S. Census Bureau is part of the U.S. Department of Commerce. The U.S. Census Bureau is overseen by the Economics and Statistics Administration (ESA) within the Department of Commerce.

[45] Indeed, under a Canada-U.S. trade data sharing agreement, Canada accepts the U.S. Census Bureau official import data as Canada export data for the products. There is no such agreement with Mexico, however, it is widely accepted that U.S. import data is more accurate than Mexico's export data.

[46] U.S. Written 22.6 Submission (Canada), paras. 108-109. Canada notes that it relies on APHIS data because the weekly data provides more observations and thus is more precise. Canada's Written 22.6 Submission, para. 51. However, the suggestion that more, but less accurate data is helpful for meaningfully quantifying the effect of the amended COOL measure is simply not true. Quantity does not trump quality.

[47] U.S. Written 22.6 Submission (Mexico), para 80.

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costs, on the basis of a lack of suitable variables or data is an insufficient approach,[48] and renders the econometric analysis of the price basis biased and imprecise. This issue is exacerbated by comparing mixed data from different markets or different sources where it is difficult to understand whether an apples-to-apples approach is taking place under the requesting parties' opaque approach.

36.　　Conversely, the EDM methodology models the impact of removing the amended COOL costs on the actual prices and quantities in the market in 2014 based on U.S. official trade data. Thus, the results reflect what the prices in the United States would be if those costs were removed. This is an accurate method for determining the magnitude of the trade effects in these arbitrations.

7.　　**_United States and Mexico_: Do the United States and Mexico agree with the criteria for inclusion of an explanatory variable as set out by Canada in paragraph 38 of its written submission?[49]**

37.　　No, the United States does not agree with the standard set out by Canada.

38.　　As discussed in the U.S. Written 22.6 Submissions, the reduced form econometric modeling proposed by Canada and Mexico is far too simplistic and is not adequate to accurately isolate and quantify the magnitude of any potential effects of the amended COOL measure.[50] The results produced by a reduced form model are highly dependent upon the variables included in the model, as recognized by previous *US – COOL* panels.[51] Specifically, in a complex market, such a model must control for a large number of other explanatory variables to produce accurate results. Yet Canada's Methodology Paper indicates that its econometric model only addresses five relevant variables for cattle and four for hogs, while Mexico's Methodology Paper indicates that its model addresses only four variables for cattle.[52]

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[48] Canada's Written 22.6 Submission, para 44.

[49] Canada's written submission, para. 38. ("First, strong economic reasons must exist to think that they have causal impact on the dependent variable. Second, they must be clearly exogenous, that is they are not caused by the other variables in the model. Third, they must not be temporally correlated with the dependent variable in some non-causal or random way to avoid biasing impacts of other variables.").

[50] *US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para 7.184. U.S. Written 22.6 Submission (Canada), para. 96-100; U.S. Written 22.6 Submission (Mexico), para. 69-72.

[51] *See, e.g., US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para 7.184. The compliance panels clarified that "econometrics . . . also allows for a quantification of different factors that explain the evolution of livestock's price basis and import ration, such as the general economic situation, the occurrence of specific events (e.g., BSE ban), seasonal effects, changes in transportation costs, exchange rate fluctuations and other relevant determinants," and the compliance panel "agree[d] that such factors could affect or possibly invalidate any conclusion on the estimation of the impact of the original and amended COOL measure on the quantity and price of imported livestock."

[52] Canada's Methodology Paper, paras. 67-73, 79; Mexico's Methodology Paper, Exhibit MEX-2, pp. 10-11.

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39.   In lieu of modifying its model, Canada has stated that it has developed a "parsimonious" model,[53] and "avoids including extraneous variables."[54] Canada's dismissal of the other explanatory variables cited by the United States as relevant to this question falls flat. Neither "significance," nor lack of availability of data explain whether or not a variable should be included in the model. Rather, all other relevant explanatory variables *must* be controlled for to isolate the impact of COOL on the dependent variable.

40.   Econometric theory sets out that a model chosen for empirical analysis, including the variables represented within that model-mode, should satisfy the following criteria (which includes the criteria set out by Canada and additional criteria as well as a number of caveats): [55]

- All predictions made from the model must be logically possible;[56]

- The model must be consistent with economic theory;[57]

- Explanatory variables must be exogenous or uncorrelated with the error term;

- Parameter values must be stable otherwise predictions will be unreliable;

- Residuals estimated from the model must be random;

- The model should consider all rival models, that is, other models cannot be an improvement over the chosen model.

This list is clearly more extensive than that provided by Canada.

41.   We note that while it is possible in theory to list the criteria for a "good" model, it is challenging in practice to actually develop such a model. As demonstrated by Canada and Mexico's econometric analysis, models often violate theoretical model assumptions and commit various model specification errors, including omitting relevant variables and incorrect functional forms, or commit errors of measurement bias (for example. using proxies due to unavailable data, using secondary data sources, or omitting observations). Failure to provide a "good" model which follows these common sense requirements will result in biased and/or inconsistent estimates.

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[53] Canada's Written 22.6 Submission, para. 25.

[54] Canada's Written 22.6 Submission, para. 26.

[55] Damodar N. Gujarati, *Basic Econometrics*, Fourth Edition, McGraw-Hill Irwin, 506-508 (2003) (Exhibit US-48) (*citing* D.F. Hendry and J.F. Richard, "The Econometric Analysis of Economic Time Series," Int'l Stat. Rev., vol. 51, 3-33 (1983)).

[56] That is, the results of the model automatically satisfy all known data constraints, and do not result in impossible scenarios.

[57] That is, the model, including the selection of variables must make "good economic sense."

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42.   Of particular concern is Canada and Mexico's failure to include all relevant explanatory variables. When attempting to use econometric modeling to describe a complex economic system, there are numerous potentially relevant variables and these must be modeled jointly to provide a coherent analysis. Failure to include substantive variables will result in erroneous conclusions, as other aspects of the model attempt to proxy the missing information. In particular, omitting relevant variables (or under fitting the model) which are correlated with the included variables will result in biased and inconsistent estimates.[58] Economic theory indicates that the bias does not disappear as the sample size gets larger. As a result, "the usual confidence interval and hypothesis-testing procedures are likely to give misleading conclusions about the statistical significance of the estimated parameters."[59]

43.   In this dispute, to be consistent with economic theory, the econometric model presented by Canada and Mexico must represent all relevant demand and supply shifters in Canada, Mexico, and the United States. That is, all factors that drive price and quantity changes should be included in the model to accurately isolate the effect of the COOL measure. The most significant of these are described in the U.S. submission,[60] but these are in no way the only economically relevant factors.[61] Neither Canada nor Mexico has met this condition. Moreover, some of Canada's equations do not meet Canada's stated criteria.

8.   ***All parties*: Please elaborate on the "economic reasons" for accepting that an explanatory variable has a causal impact on the dependent variable.[62] In order to substantiate such "economic reasons", does a party have to assert and prove on the basis of theoretical reasoning or through actual estimation that the inclusion (or exclusion) of a given variable would result in different estimates? In view of the applicable burden of proof, would the objecting party be required to demonstrate the results of including or excluding a given variable in order to establish its *prima facie* case?**

44.   Economic theory provides the rationale for the "economic reasons" for accepting that an explanatory variable has a causal impact on the dependent variable.

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[58] Gujarati, *Basic Econometrics*, at 510 (Exhibit US-48).

[59] Gujarati, *Basic Econometrics*, at 510 (Exhibit US-48) (citing for an algebraic treatment, Jan Kmenta, *Elements of Econometrics*, Macmillan, New York, 391–399 (1971), and J. Johnston, *Econometrics Methods*, 4th ed., McGraw-Hill, New York, 119–112 (1997)).

[60] U.S. Written 22.6 Submission (Canada), paras. 96-100; U.S. Written 22.6 Submission (Mexico), paras. 69-72.

[61] For example, other factors include differing sale characteristics (lot size, animal size, location), consumer demand characteristics (substitutes, income), production characteristics (energy, transport costs, labor conditions, alternative uses), etc.

[62] *See* Canada's Written 22.6 Submission, para. 38 ("First, strong economic reasons must exist to think that they have causal impact on the dependent variable.").

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45.   As described above, a "good" econometric model must "be consistent with economic theory." In the context of an econometric analysis of price and quantity effects, this logically requires the inclusion of all relevant variables that may affect price and quantity concurrently with the variable of interest, the amended COOL measure. Thus, the failure to include in the model all explanatory variables – which under economic theory – are likely to affect the outcome calls into question the validity of the model results.

46.   It is not necessary for the challenging party to provide actual estimations of the effect inclusion of these variables would have on the model, because as Canada points out, in many cases it is not possible in practice to include the omitted variables. In some cases, there are no data available or method to estimate the data that would allow for adequately controlling for the impact of these additional variables.[63] It is sufficient to submit arguments and evidence that economic theory – and in fact, common expert knowledge – would indicate that any robust econometric model would need to consider and account for these factors or risk attributing a wide range of other phenomena to the variable that the model is seeking to isolate.

47.   This demonstration of inconsistency in the econometric model through the failure to follow sound economic principles is sufficient to prove that the level of suspension of concessions requested by Canada and Mexico is not equivalent to the level of nullification and impairment.[64]

9.   *All parties*: **The United States identifies a number of variables that it argues should have been included in Canada and Mexico's respective econometric models.[65] Please indicate for each of these variables whether there are data that could be used to specify a variable and, if not, whether there is a suitable set of proxy data that could be used.**

48.   As noted in the U.S. Written Submissions, there are a wide range of variables that should be accounted for in Canada and Mexico's econometric analysis, including, but not limited to, feed prices, recession, BSE, shifting processing, drought/weather, U.S. holidays, and transportation costs.[66] These are only the most obvious variables. Additional issues related to the pattern of trade – such as size of lots, types of transaction, sex of animals, and sorting of lots

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[63] Canada's Written 22.6 Submission, paras. 44-45.

[64] *EC – Hormones (US) (Article 22.6 – EC)*, para. 9 ("Following well-established WTO jurisprudence, this means that it is for the EC to submit arguments and evidence sufficient to establish a *prima facie case* or presumption that the level of suspension proposed by the US is not equivalent to the level of nullification and impairment caused by the EC hormone ban."); *see also US – Gambling (AB)*, para. 140; *US – Wool Shirts and Blouses (AB)*, at 16.

[65] U.S. Written 22.6 Submission (Canada), paras. 96-100; U.S. Written 22.6 Submission (Mexico), paras. 69-72.

[66] U.S. Written 22.6 Submission (Canada), paras. 96-100; U.S. Written 22.6 Submission (Mexico), paras. 69-72.

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– vary between the United States, Canada and Mexico, as well as over time. Failure to include these variables results in biased econometric estimates.

49.   In many cases there is data related to the variables cited by the United States, however the available data is frequently unsuitable for the purposes of the econometric analysis since it introduces measurement errors and inaccurate estimates. In particular, the United States notes that Canada uses unofficial weekly APHIS price and quantity data as a baseline, thus setting up a weekly analysis. For most of the important demand-side variables and many of the supply-side variables, data are available on a monthly basis, at best. For many of the macroeconomic variables, data are available on a quarterly basis only. Some variables have no plausible data available.

50.   Transformation of time series data into weekly observations, in Canada's own words, "renders their interpretation problematic."[67] In order for these transformed data to be significant, the quarterly/monthly-to-weekly transformation also has to be accurate. For instance, poorly-designed proxies or translation methods may result in insignificant variables even if the "true" exogenous variable matters to the system. That is, there may not be enough COOL-period observations to measure statistically-significant results.

51.   Noting the significant difficulties, the United States understands the following potential data and data proxies to potentially be available:

- <u>Recession</u>: The recession resulted in unemployment and underemployment, falling incomes and rising poverty, and decrease in overall wealth. It is logical that significant declines in consumer income would affect purchasing habits and thus demand for beef and pork. Further, it is important to note that unemployment continued to fall well beyond June 2009, when the economy began to recover.[68] Additionally, despite Canada's statements to the contrary, it is well accepted that recession impacted the United States and Canada differently.[69] Thus, demand for meat in Canada (and in Canada's export markets) was subject to a differential effect as compared to the United States.

  In past iterations of this dispute, either a dummy variable or an unemployment variable have been used to indicate the recession. Both methodologies raise significant issues. As described in response to Question 13, the dummy variable raises significant concerns as to multicollinearity. Using unemployment rates or the difference between unemployment rates as a recession proxy, raises serious problems, since it is a lagging indicator. Other data

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[67] Canada's Written 22.6 Submission, para. 42 (referring to the "troublesome properties of time series data on feed costs" that "became apparent after the publication" of Sumner and Pouliot academic work in 2014).

[68] General Economic Indicators (Exhibit US-37).

[69] Sumner and Poulit (2014), 111 (Exhibit US-35).

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sources, such as Gross Domestic Product (GDP), income per capita, consumer spending, also exist.[70]

- Feed costs: Feed costs and variances in feed costs between the United States, Mexico and Canada are an important variable for explaining difference in price, as well as volumes of exports.[71] As noted by Sumner and Pouliot in their academic work, monthly data on the price of various feeds (corn, barley, and soybean) are available on a monthly basis from the Bank of Canada and USDA.[72] However, as indicated by Canada, there are issues with converting this data from monthly into weekly data. That said, lack of an appropriate estimate is not an indication that a variable does not have explanatory power.

- Transport Costs: A number of proxy data sources may be considered for transportation costs. For instance, distance from rancher to feed lot, average gasoline and diesel prices,[73] and similar widely reported sources.

- Processing Capacity and Plant Closure: Canada and Mexico both have their own processing plants which demand livestock inputs. The econometric analysis could account for increases and declines in this production capacity through an analysis of total slaughter capacity and capacity utilization. The United States is however not aware of a repository of this data.

- Other Completing Imports: In previous submissions, Canada has implicitly included Mexican imports through the quantity ratio dependent variable. In the current econometric models neither Canada nor Mexico includes imports from the other country in estimating the impact of COOL on their country's import quantities. However, as documented throughout this proceedings, there clearly are data on the imports from Canada and Mexico that could be used in the estimations

52.   Further, other variables – such as holidays and drought conditions – can likely only be addressed through dummy variables. However, as described in response to Question 13 and the U.S. Written Submissions, the inclusion of numerous dummy variables introduces additional uncertainty into the model and thus its results.

10.   *All parties*: The United States refers to a number of variables the relevance of which was already addressed in previous proceedings.[74] Should these variables receive a different treatment in the context of this Article 22.6 arbitration proceeding?

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[70] *See generally*, U.S. Bureau of Economic Analysis, available: http://www.bea.gov/.

[71] These costs are not endogenous as the price of feed is related to numerous other factors such as the weather, and demand in other sectors.

[72] Sumner and Pouliot (2014), at 111 (Exhibit US-35).

[73] Diesel and Gasoline Price Trends (Exhibit US-43).

[74] U.S. Written 22.6 Submission (Canada), para. 99; U.S. Written 22.6 Submission (Mexico), para. 71.

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53.   Yes, given that the purpose of an Article 22.6 arbitration is different from a panel proceeding, the variables included in the econometric analysis and "robustness" of the overall methodology should be subject to a more rigorous inquiry designed to ensure that the effects of the amended COOL measure are adequately isolated and meaningfully quantified. This stands in clear contrast to the question of whether a negative impact occurred and cannot be accomplished through econometric analysis in this industry and with the data available. As noted above, Article 22.6 arbitrators are "called upon to go further," than panels.[75]

54.   As described above, in the course of making the binary determination of whether the COOL measure and amended COOL measure resulted in a disparate impact, the panel and compliance panels noted that consideration of trade effects, while not necessary, was informative.[76] The purpose of this analysis was to determine whether a detrimental impact occurred, not quantify with any level of specificity any particular impact. Even in the course of this more general analysis, the panel and compliance panels cited the importance of accounting for the impact of other contributing factors.

55.   For instance, the panels found that "the evidence of a significant negative impact" was "robust due to the inclusion of additional explanatory variables such as transport costs, the BSE import ban and economic recession,"[77] as well as the "use of a dummy variable and the unemployment ratio for measuring the economic recession."[78] Similarly, the compliance panels clarified that "econometrics . . . also allows for a quantification of different factors that explain the evolution of livestock's price basis and import ratio, such as the general economic situation, the occurrence of specific events (e.g., the BSE ban), seasonal effects, changes in transportation costs, exchange rate fluctuations and other relevant determinants,"[79] and the compliance panels "agree[d] that such factors could affect or possibly invalidate any conclusion on the estimation of the impact of the original and amended COOL measure on the quantity and price of imported livestock."[80]

56.   This Article 22.6 proceeding calls for more precise and detailed evidence than a finding of detrimental impact. In particular, it is impossible using econometrics to isolate the magnitude impact of the amended COOL measure without adequately controlling for all other variables impacting the price and quantity of livestock imports. For this reason, the suggested level of suspension must be based on an alternative model that provides a clearer and more accurate

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[75] *EC – Hormones (US) (Article 22.6 – EC)*, para. 12.

[76] *US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para 7.183 (citing *US – COOL (Panel)*, paras. 7.438-453, *US – COOL (AB)*, paras. 314-326).

[77] *US – COOL (Panel)*, para. 7.540.

[78] *US – COOL (Panel)*, para. 7.540.

[79] *US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para 7.184.

[80] *US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para 7.184.

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account of the impact of the amended COOL measure than provided to the panel or compliance panels, or indeed provided to the Arbitrators in either Canada or Mexico's Methodology Papers.

11.   *All parties*: **If there is evidence that the inclusion of a particular variable in an econometric model does not change the result of the other explanatory variables, is that sufficient justification to exclude that variable from the model specification? How can the exclusion of a variable be justified in the absence of such evidence?**

57.   Evidence that the inclusion of a particular variable in an econometric model does not change the results of the other explanatory variable is insufficient justification to exclude that variable from the model specification when economic theory indicates that it should be included. If, for example, the estimated coefficient of the omitted variable is zero, dropping it from the model may not affect the estimated coefficients of other explanatory variables. However, the variance of the estimated coefficients would be biased which would affect hypothesis testing procedures. As a rule of thumb, once a model is formulated on the basis of economic theory, it is ill-advised to drop a variable from such a model since the variance of the estimated coefficients would be biased and the hypothesis testing procedures would be inaccurate due to misspecification.[81]

58.   In addition, a variable's statistical significance does not depend on whether or not including it in a regression changes the other coefficients' estimates. In fact, stable models with appropriate regressors should not see significant changes in their coefficients if a new variable is added to the model. One may use standard statistical tests to justify the inclusion of a variable.

12.   *All parties*: **What would be an appropriate way to assess the robustness of the econometric results?**

59.   A common exercise in empirical studies is a robustness check on how estimated regression coefficients behave when the regression specification is modified by adding or removing exogenous variables. If the coefficients do not change with the various model specification, then this is often interpreted as evidence of robustness. That is, robustness refers to a model that yields estimated coefficients that are relatively stable both in term of signs and magnitudes of effects as additional explanatory variables are included in the model. In contrast to Sumner and Pouliot's academic work, neither Canada, nor Mexico provide any such evaluation in their Methodology Papers.[82] In particular, we find significant differences between the variables considered, findings, and the revised results in Canada and Mexico's Methodology Paper and this academic work.

60.   Finally, the term "robustness" may also apply to the estimation processes. It is important to use estimation processes that are "robust" in the sense that they do not force conclusions that are inconsistent with the data, or are not influenced by specific time periods and unusual events

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[81] Gujarati, *Basic Econometrics*, at 513 (Exhibit US-48).

[82] Sumner and Pouliot (2014) (Exhibit US-35).

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in the data. All the econometric models have been estimated using ordinary least squares (OLS). OLS is statistically reliable if the exogenous variables meet the conditions discussed in Question 7. If important exogenous variables are excluded, the OLS parameter estimates will be biased and inefficient. The result is that the estimates will be imprecise and have a significantly higher amount of variability than estimates derived from a well-specified model.

13.   *United States*: **Why would the use of increasing numbers of concurrent dummy variables necessarily put into question the validity of the econometric estimation?[83]**

61.   A dummy variable is a binary variable which takes on a value of 0 or 1 to classify data into mutually exclusive categories.[84] They are primarily intended to represent qualitative attributes in a model, or those attributes characterized by categorical rather than continuous measures (e.g., "short" or "tall" as opposed to "height measured in centimeters"). They are essentially devices to categorized data into mutually exclusive categories.

62.   Dummy variables can also be used as proxies when accurate data is not available to measure accurately reflect the gradual increase or fall of a particular circumstance. For example, although it is true that there are distinct days when the COOL measures were not and then were effective, the reality is that steps toward compliance took place over time both before and after the effective dates for the measures. In particular, the original COOL measure was first proposed in 2003 and did not become effective until 2009. Throughout this period, firms were taking steps toward compliance, and full compliance was not achieved on the effective date as firms continued to learn about the requirements of the rule and adjust their operations accordingly. Thus, the selection of the date for the switch from "0" to "1" for the value of the binary COOL variable is arbitrary, and the estimated value of the coefficient would in turn be influenced by that arbitrarily chosen date. A similar issue will appear if dummy variables are used to reflect other explanatory factors such as the recession. The recession did not stop and start on a particular day, but worsened overtime.

63.   Finally, inclusion of multiple overlapping dummy variables in the econometric equations raises significant concerns as additional dummy variables potentially begin to introduce the problem of multicollinearity which could interfere with the estimation of the variable of interest and could affect the validity of the overall regression. In particular, using increasing numbers of concurrent dummy variables potentially introduces multi-collinearity or the "dummy variable trap."

64.   Multi-collinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated. In this situation the coefficient estimates may change erratically in response to small changes in the model or the data. Multi-collinearity does not reduce the predictive power or reliability of the model as a whole, at least within the sample data themselves; however, it affects calculations regarding individual predictors. For instance, if

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[83] U.S. Written 22.6 Submission (Mexico), para. 73; U.S. Written 22.6 Submission (Canada), para. 101.

[84] Gujarati, *Basic Econometrics*, at 298 (2003) (Exhibit US-48).

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the model included the COOL dummy variables, a drought dummy variable, a recession dummy variable, and other dummy variables controlling for other relevant causal factors, then the multiple dummy variables would render the econometric model unable to distinguish between the impact of the amended COOL measure and other highly correlated dummy variables included. In effect, the model will not be able to determine which dummy variable to attribute various effects. For this reason, the econometric model requires accurate estimation of the omitted variables.

14.   *All parties*: **Could the parties suggest any statistical tests to assess whether the estimated model specification fits the data?**

65.   There are a number of statistical checks and tests which may assist in an assessment of whether the estimated model specifications fits the data. First, assessing a number of broad features of the results, such as the R-squared value,[85] the estimated t-ratios, and signs of the estimated coefficients in relation to their prior expectations, may assist in determining whether a chosen model specification fits a particular data set.[86] Additional statistical tests such as, adjusted R-squared, Akaike Information Criterion (AIC), and Schwarz Information Criterion (SIC) may help to determine how well theestimated model specification fits the data.

66.   However, when legitimate variables are omitted from the model, the consequences are serious. This underscores the critical need to look beyond the technical aspects of the econometrics to the practical aspects and economic theory. As we noted before, finding appropriate supply and demand shifters for the weekly data is a challenge. The biases caused by omitted variables can make exogenous variables that should not be in the model appear to be significant or those that should be in the model appear insignificant. Thus, extra attention should be paid to making sure the model is properly specified and that issues should not be dismissed as an effort to "divert attention."

15.   *United States*: **With regard to Canada's sample period, is the United States making the same argument that it made in the original proceedings?[87] If so, the panel noted then that the estimated results were robust as to the inclusion of the BSE period.[88] Does this finding apply here? If not, why not?**

67.   The original panel found that the econometric analysis of Dr. Sumner was "sufficiently robust," in part, because "the inclusion of the BSE period and the recovery period from economic recession confirms that the evidence of the impact of the COOL measure is not

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[85] The coefficient of determination, R^2, is used in the context of statistical models whose main purpose is the prediction of future outcomes on the basis of other related information. It is the proportion of variability in a data set that is accounted for by the statistical model. It provides a measure of how well future outcomes are likely to be predicted by the model.

[86] Gujarati, *Basic Econometrics*, 517 (Exhibit US-48).

[87] Panel Reports, *US – COOL*, para. 7.518.

[88] *See* Panel Reports, *US – COOL*, para. 7.540.

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specific to a given analysis period."[89] That is, the panel found that despite not including pre-BSE period data, the post-BSE period was sufficient to demonstrate that the impact of the COOL measure was not specific to these events.

68.   In the context of an Article 22.6 arbitration and the mandate to "go further" to quantify the effect of the impermissible measure, the data set utilized by Canada is insufficient.[90] The finding that the econometric model was "sufficiently robust" during the original panel proceeding does not necessarily apply and this issue should be reexamined.

69.   In particular, Canada utilizes a data set that is dominated by the BSE incident or with the COOL measure.[91] While Canada asserts that trade resumed in July 2005, the econometric analysis maintains a BSE dummy variable until November 2007, consistent with the lifting of the BSE ban. Thus, just 9 percent (or 45 of 489) of observations are subject to neither COOL, nor the BSE ban.[92] As described in the U.S. submission, even after the U.S. ban on imports of Canadian livestock under 30 months of age was lifted, BSE remained a significant issue with certain U.S. import barriers still in place and with subsequent barriers to trade in third countries persisting.[93] Moreover, in the original panel proceeding, Canada did, at the behest of the panel, provide analysis covering the period 2001 to 2010, thus providing pre-BSE and pre-COOL analysis.[94] By not accounting for those and other factors such as the effects of additional BSE episodes by utilizing pre-BSE data, Canada provided an economic model that attributes to the amended COOL measure fluctuations in Canadian exports of livestock cattle that are in fact due to other factors.

16.   *United States*: In respect of the USDA AMS pricing data, did the United States use the same source of data (namely AMS statistical data) as Mexico?[95] If so, is the use of such data in the EDM distinguishable from the use of such data in Mexico's model?[96]

70.   While the United States and Mexico both use 2014 calendar year data, the per unit value of U.S. imports of feeder cattle from Mexico differs greatly from the "export price" that Mexico used. This is because while the United States relied on verified and corrected U.S. Census Bureau data, Mexico relied on AMS Marketing News Reports. The USDA AMS Market News price series may not be fully representative of all feeder animals that the Unites States imports

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[89] *US-COOL (Panel)*, para. 7.540.

[90] U.S. Written 22.6 Submission, para. 110.

[91] Corrected Exhibit CDA-035 and Corrected Exhibit CDA-036. Providing data for September 2005 through January 2015.

[92] Corrected Exhibit CDA-035.

[93] U.S. Written 22.6 Submission, para. 99.

[94] Canada's Answers to Second Set of Panel Questions, para. 67 and Exhibit CDA-206.

[95] *See* Mexico's written submission, para. 50.

[96] U.S. Written 22.6 Submission (Mexico), para. 80.

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from Mexico because the AMS data reports daily auction results and does not include purchases made through other mechanisms (directly contracting, etc.). In particular, feeder cattle from Mexico may not be sold at auction, but rather on the basis of forward contracts or pricing devices. There could be other differentiating factors, such as quality, size, and other attributes, that affect the average price for Mexican feeder cattle exported to the United States. Therefore, the use of the AMS price data likely overstates the baseline prices for Mexican cattle imported into the United States, which is one reason why Mexico's price basis analysis is inaccurate.

71. Moreover, as described in the table below, Mexico's official trade data demonstrates that the per unit export value is much closer to the per unit U.S. import value that the U.S. Census reports. Using the "export price" based on AMS market news information results in a value of trade that greatly exceeds the value of Mexico's exports to the United States, using either U.S. or Mexican official trade statistics.

Mexico's Estimated Baseline	$1.25 billion	Calculated by multiplying the base price and base volume reported by Mexico on page 24 of Exhibit MEX-2.
U.S. Estimated Baseline	$736.48 Million	Calculated from U.S. Census Bureau Data.
Mexico's Reported Export Value	$749.46 million	GTIS, using data from INEGI - Instituto Nacional de Estadistica y Geografia[97]

Note: Mexico's official export data may not fully correspond to that from the U.S. submission because it is specified primarily at the 6-digit level, while the U.S. import data are at the 10-digit level. Therefore, this figure may include exports that would be considered outside the scope of this dispute (*e.g.*, dairy cows, etc.). The HS codes used for Mexico's exports are HS 0102.29 and HS 0102.90. A list of HS codes used for the U.S. import value (and volumes) are listed in Exhibit US-4.

72. Finally, the United States notes that all import prices and quantities in the EDM are based on U.S. import statistics from the U.S. Census Bureau. The U.S. EDM also utilizes domestic livestock prices. For feeder pigs, the best available data, as cited in Tabs 4 and 8, is the AMS Marketing News report. This is the only available source of this information (as compared to Mexico which could use import data), and the EDM uses data from the whole country, rather than localized data.

2.2 Mexico's elasticity simulation for quantity impact

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[97] *See* http://www.inegi.org.mx/.

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17.   *Mexico*: **Please explain why Mexico used an elasticity-based simulation to determine the quantity impact of the COOL measure, rather than an econometric analysis.**

18.   *Mexico and the United States*: **Rather than specify a single elasticity value, could Mexico and the United States provide a range of elasticity values within which Mexico's actual supply elasticity would fall?**

73.   Both Mexico and the United States recognize that there is a lack of estimates of supply elasticity in the academic literature. While the U.S. EDM relies on the peer-reviewed elasticity of supply of meat, Mexico sought to generate a new elasticity based on a single year of data. The elasticity used in the EDM uses is a short-run elasticity, which means it covers one year, while Mexico has estimated a long-run elasticity, which covers ten years.[98]

74.   It is possible to estimate a transition from a short-run elasticity to a long-run elasticity following a linear trend, as was done in the Tonsor, et al. (2015) study on the domestic effects of COOL. Using Mexico's long-run elasticity of 4.0 for the supply of Mexican feeder cattle to the United States and deriving the short-run export supply elasticity for feeder cattle using Mexico's methodology,[99] the following range of elasticities can be derived:

Range of Elasticities for Supply of Feeder Cattle

Year	Elasticity of Supply for Mexican Feeder Cattle
1	0.54
2	0.92
3	1.31
4	1.69
5	2.08
6	2.46
7	2.85
8	3.23
9	3.62
10	4.00

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[98] Glynn Tonsor, Ted Schroeder, and Joe Parcell, *Economic Impacts of 2009 and 2013 U.S. Country-of-Origin Labeling Rules on U.S. Beef and Pork Market,* Kansas State University Project Number AG-3142-P-14-0054 R0 (2015), at 40-41 (MEX–Appendix 15) (hereinafter Tonsor, et al. (2015)). *See also* Gary W. Brester, John M. Marsh, & Joseph A. Atwood, *Distributional impacts of country-of-origin labeling in the U.S. meat industry,* J. OF AGRIC. & RES. ECON. 29(2), 217, 222 (2004) (hereinafter Brestor, Marsh & Atwood (2004)) (MEX-Appendix 4).

[99] Mexico Methodology Paper, pp. 18-21 (Exhibit MEX-2). Mexico uses the estimated long-run supply elasticity for U.S. feeder cattle (2.82) for the long-run supply elasticity for Mexico. The short-run supply elasticity for U.S. feeder cattle is 0.22 (same sources as those cited in Mexico's methodology paper). Using Mexico's methodological approach, we calculate a short-run export supply elasticity of 0.54. (0.22/0.75 minus (1-0.75)/0.75 times -0.75).

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2.3   **Canada's descriptive method for feeder pig prices**

19.   *Canada*: [[

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20.   *Canada and the United States*: [[

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75.   [[

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21.   *Canada and the United States*: **Please identify any possible proxy data for the price of feeder pigs that could be used to estimate the model econometrically.**

76.   Canada's assertion that no consistent time series amenable for statistical analysis is available for feeder pigs in Canada is not accurate. Agriculture and Agri-Food Canada provides several different reports that include feeder pig (in a number of weight categories) prices on a weekly, monthly, and yearly average basis for an extensive time series. In fact, one of those reports, the "Red Meat Price Report for Hogs (W042C)," is the source of Canada's slaughter hog price data series.[101] Additionally, Canada may use the U.S. census data that the EDM relies on. Thus, there is no sound basis to rely on [[   ]], whose only purpose appears to be to improperly inflate Canada's proposed level of nullification and impairment.

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[100] Canada's written submission, para. 55.

[101] Reports including W042C may be generate through Agriculture and Agri-Food Canada's website, *available*: http://www.agr.gc.ca/eng/industry-markets-and-trade/statistics-and-market-information/by-product-sector/red-meat-and-livestock/red-meat-market-information-canadian-industry/prices/?id=1415860000004.

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2.4   Domestic Price Suppression

22.   *All parties*: **With respect to the "arbitrage" mechanism described by Canada and Mexico in relation to changes in export price, what are the different factors that would explain a diffusion or reduction of the price impact in a domestic market?**

77.   As discussed in the U.S. submissions, Canada and Mexico's estimated economic effects of COOL in their domestic markets, which they both refer to as "price suppression losses," are outside the scope of this proceeding as there is no basis under the DSU for considering domestic price suppression as a part of the level of nullification or impairment of benefits under the TBT Agreement or the GATT 1994.[102] Indeed, it is notable that neither Canada nor Mexico has, *until this very arbitration*, considered that the "benefits accruing" under the WTO Agreement meant anything other than *the trade* in livestock. Thus, in their GATT Article XXIII claims before the compliance panels, Canada and Mexico claimed that the "benefits accruing" relate to *the market access of the livestock exported* to the United States,[103] a point that the compliance panels recognized.[104]

78.   Now the requesting parties contradict themselves and argue that the "benefit accruing" is not limited to its market access for their exports but is a benefit tied to the measure itself.[105] Of

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[102] *See* U.S. Written 22.6 Submission (Canada), paras. 118-130; U.S. Written 22.6 Submission (Mexico), paras. 56-81.

[103] Canada's First Written 21.5 Submission, para. 183 ("GATT Article XXIII:1(b) provides that a Member may have recourse to WTO dispute settlement if it considers that any benefit accruing to it directly or indirectly under the GATT 1994 is being nullified or impaired as the result of the application by another Member of any measure, whether or not it conflicts with the provisions of this Agreement. Although the tariff treatment *of Canada's exports* to the United States is currently governed by the NAFTA, Canada is entitled to expect *market access* to the United States for its cattle and hogs that corresponds to the tariff concessions that would apply, on a MFN basis, between the United States and Canada under the WTO Agreement in the absence of the NAFTA. These tariff concessions create expectations as to the competitive relationship between Canadian and U.S. cattle and hogs. By applying the requirements of first the original COOL measure and now the amended COOL measure, the United States has upset the competitive relationship between U.S. and Canadian livestock and has frustrated Canada's legitimate expectations *for exports of its live cattle and hogs to the United States*.") (emphasis added); Mexico's First Written 21.5 Submission, para. 239 ("This benefit can be measured in terms of "legitimate expectations" of *improved market-access opportunities*.") (emphasis added); *id.* para. 241 ("While it is arguable whether particular regulations on point of processing labelling could have been reasonably expected, the extent of *the restrictions on market access* resulting from the Amended COOL Measure clearly could not have been expected. Through the Amended COOL Measure the U.S. *has nullified or impaired the unhindered market access* that Mexico was entitled to expect *for exports of its feeder cattle*.") (emphasis added).

[104] *US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para. 7.676 ("Canada and Mexico claim that the benefit nullified or impaired consists of legitimate *market access expectations* from the United States' tariff concessions under the GATT 1994.") (emphasis added) (citing Canada's First Written 21.5 Submission, para. 183; Mexico's First Written 21.5 Submission, paras. 239-241; U.S. First Written 21.5 Submission, para. 208); *see also US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para. 7.677 ("Based on this, we consider that benefits for live swine are currently being enjoyed by the complainants under the GATT 1994 in the sense *that relevant trade is conducted under its concessions*.") (emphasis added).

[105] *See* Mexico's Written 22.6 Submission, para. 57 ("Like the export price and volume effects, this domestic price suppression effect is directly related to the nullification or impairment at issue. In simple terms, the

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course, Canada and Mexico can find no support for their novel view in the text of the WTO Agreement or in the Article 21.5 panels' reports, which addressed this precise issue.[106]

79.   As the question notes, both Canada and Mexico assert that the high level of integration of the North American livestock sector results in price arbitrage between the export price of cattle and hogs and the price of domestic cattle and hogs.[107] The United States understands that by "price arbitrage" Canada and Mexico to mean that the reduction in their respective export prices (which they fully attribute to COOL) leads to the same reduction in their respective domestic prices. This would appear to be an unconventional use of the term "arbitrage." However, the United States does observe that Mexico, despite making this unsupportable argument in its written submission, appears to argue in its Methodology Paper that the export price is not, in fact, fully transmitted back to domestic producers.[108]

80.   For the arbitrage factors you would need to take into account different factors would need to be taken account of than the ones accounted for in attempting to calculate loss of export revenue. In particular, variables would need to be included that would allow for explicit identification of domestic supply and demand within their respective countries, rather than merely relying on export supply equations to the United States, as the requesting parties have done so thus far.

81.   Moreover, variables would need to be included to account for export supply and demand with respect to the rest of the world, as domestic losses in Canada and Mexico would need to be isolated from trade, not only with the United States, but also with other trading partners not necessarily taken into account in determining export revenue loss with respect to the United States. For instance, factors that shift domestic demand in Canada and Mexico, including but not limited to changes in consumer tastes, changes in the price of substitute goods, changes in the price of complementary goods, measures of employment, income, and interest rates would need to be included.[109] In addition, variables would need to be included to identify and measure factors that affect Canadian and Mexican trade with respect to the rest of the world because a change in demand for exports from Canada or Mexico of meat to other trading partners could affect prices in the domestic market (and also affect exports of livestock to the United States).

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relevant benefit accruing to Mexico is the right of not having to face a measure like the COOL measure."); Canada's Written 22.6 Submission, para. 96 (claiming that the benefit "is national treatment for Canadian live cattle and hogs in the United States under the GATT 1994 and the TBT Agreement").

[106] *US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, paras. 7.676-690.

[107] *See, e.g.*, Canada's Written 22.6 Submission, para. 109; Mexico's Written 22.6 Submission, para. 49.

[108] Mexico's Methodology Paper, at 8 ("Although the Mexican and US feeder cattle markets are integrated, a shock on the price of exported Mexican feeder cattle is not expected to be fully transmitted to the Mexican domestic feeder cattle market because there are different categories of feeder cattle in Mexico, reflecting regional differences in cattle breeds and transaction costs.").

[109] To take just one example, even if domestic cattle prices decline in Canada, rising incomes and favorable economic conditions could lead to expanded demand for cattle. This effect should be controlled for in the economic model or the neglected effect with exacerbate the impact of the price decline.

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And for the reasons the United States has previously discussed, econometric estimation would be incapable of calculating domestic loss just as it is an inappropriate tool for determining export revenue loss.

82.   Finally, and very significantly, as the United States previously noted, any analysis of whether the level of suspension of concessions is equivalent to the level of nullification or impairment would need to account for the economic effects of the suspension of concessions in the United States.[110] Otherwise, the level of suspension would not be equivalent to the level of nullification or impairment. Yet the DSU requires such equivalency.[111] Such an analysis of the broader economic effects on the U.S. economy would require specification of precisely which concessions were being suspended and in what manner. This would require specifying, for example, on which tariff lines Canada or Mexico would suspend concessions and how any resulting increased tariffs would affect the U.S. economy. But the Arbitrators do not have that information and could not ensure equivalence. Indeed, Canada concedes that the Arbitrator is precluded by its mandate from being able to carry out the very analysis that would be required to ensure equivalency.[112] Following Canada and Mexico's proposed approach would prevent the Arbitrators from carrying out their task under Article 22 of the DSU.

83.   Both Canada and Mexico argue that the impact of the suspension of concessions is not related to the level of nullification or impairment.[113] But that misses the point. Article 22.4 of the DSU requires that: "The level of the suspension of concessions or other obligations authorized by the DSB shall be equivalent to the level of the nullification or impairment."

84.   There are two sides to the equation at issue. And if losses in the domestic market of Canada and Mexico supposedly related to the amended COOL measure were reflected in the level of nullification or impairment, then losses in the U.S. domestic market due to the suspension of concessions would also need to be reflected in order for the level of suspension to be equivalent. Canada and Mexico's approach calls for determining a level of suspension that would not be consistent with the requirements that were agreed in the DSU.

85.   Canada and Mexico thus appear to request the Arbitrators to re-write the DSU, but that is not the role of arbitrators.

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[110] *See, e.g.*, U.S. Written 22.6 Submission, paras. 126-127.

[111] *See, e.g., EC – Bananas III (US) (Article 22.6 – EC)*, para. 7.1 (deciding to take account of the impact of the WTO-inconsistent measure on the value of U.S. imports, rather than on the U.S. firms' costs and profits, and stating that to "estimate the level of nullification or impairment, the same basis needs to be used for measuring the level of suspension of concessions.").

[112] Canada's Written 22.6 Submission, n.180.

[113] Canada's Written 22.6 Submission, para. 119; Mexico's Written 22.6 Submission, para. 81.

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23.   *All parties*: **If certain variables must be included in the econometric methodology for determining export revenue loss, should those variables also be included in the calculation of domestic loss, assuming they are relevant causal factors?**

86.   For the reasons described in the U.S. response to Question 11, if certain variables must be included in the econometric methodology for determining export revenue loss, then they must also be included in the econometric methodology for determining domestic loss, assuming they are relevant causal factors. As previously stated, there is no justification for excluding relevant causal factors from econometric models since the consequences are serious and results in biased model estimates, inaccurate hypothesis tests, and flawed calculations.

87.   Although those relevant causal variables would be necessary for domestic loss calculations, they would be insufficient as there would be many other relevant causal factors that must also be included in the econometric model for determining domestic loss, that is, factors that would be relevant for explaining changes in domestic prices and quantities in Canada and Mexico but are not relevant for inclusion in the econometric methodology for calculating export loss. For example, Canada and Mexico would need to supply data to identify domestic supply and demand equations (rather than just their export supply equations), and export supply and demand to the rest of the world (excluding the United States) equations.

88.   Finally, for the reasons described in detail in the response to Question 4, econometric modeling is not the appropriate analytical tool for accurately calculating domestic loss, just as econometrics is not the correct methodology for calculating export revenue loss. The empirical econometric model simply cannot adequately control for *all* relevant causal factors and therefore it fails to correctly isolate and estimate the effects of the amended COOL measure and the corresponding export loss and domestic loss calculations are grossly overstated.

24.   *Canada and Mexico*: **Does the concept of "benefits accruing" limit the scope of nullification or impairment that can be claimed under Article 22 of the DSU, or is the only limitation the causal link to the WTO-inconsistency?**

3   **QUESTIONS ON THE UNITED STATES' PROPOSED METHODOLOGY**

25.   *United States*: **If econometric equations were correctly specified and contained appropriate and accurate data, would those equations provide a more accurate estimation than an EDM simulation? In this connection, please comment on the relative suitability of econometric analysis and EDM simulation for ex post estimations based on relevant empirical data.**

89.   <u>No</u>. While there are steps that Canada and Mexico could have taken to improve their econometric analyses, ultimately this modeling methodology will not be able to predict the magnitude of the COOL measure as accurately as the EDM does. Such econometric modeling is unable to provide an accurate estimate of the level of nullification or impairment for two interrelated reasons: 1) the inability to isolate precisely the effects of the amended COOL measure from concurrent variables; and 2) the lack of sufficient observations or data to define those variables.

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90.   <u>The inability to isolate the effects of the amended COOL measure from concurrent</u> <u>variables</u>. The econometric methodology presented in this dispute, which relies on limited price observations (to calculate an inappropriate "price basis") and quantity observations (Canada), does not sufficiently isolate the impact of the costs associated with the amended COOL measure from any number of substantive factors that influence the price and quantity observations. Failure to include these relevant variables incorrectly attributes the effect of other causal explanatory factors to the amended COOL measure, inflating the level of nullification or impairment.

91.   Canada alleges that the United States fails to recognize that bias "only occurs if some potentially explanatory variable has a particular combination of correlations," "can occur in both directions," "can be offsetting," and can be the result of "including variables that do not belong in the model."[114] On the contrary, the United States fully understands that a broad range of relevant causal variables affect the livestock market with shifting and variable influences over time on the prices and quantities of livestock traded between the United States and Canada, and the United States and Mexico. The analysis of the trade effects of the amended COOL measure cannot – as Canada suggests – ignore the relevant (and previously recognized)[115] explanatory variables. Understanding this complexity and controlling for all relevant causal factors in the model is not intended to "divert attention,"[116] but rather to adequately isolate the issue at the center of this dispute. Canada is thus simply wrong to argue that while the livestock markets are complex, "that does not mean that measuring the level of nullification or impairment caused by the COOL requirement must capture all of these complexities,"[117] as the complexities not captured in Canada's calculation will be attributed to the COOL measure, improperly inflating the level of nullification and impairment.

92.   In particular, Canada and Mexico's econometric analysis should account for economic fluctuations and recession, BSE effects, feed cost fluctuations, increased domestic processing of livestock, transportation cost changes, weather patterns, and U.S. holidays.[118] Each of these factors has a distinct impact on sales in the North American market and, moreover, affects sales

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[114] Canada Written 22.6 Submission, para. 50.

[115] *See, e.g., US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para. 7.178 (describing the inclusion of the unemployment rate in the United States and Canada, a dummy variable for the 2008 economic recession and the producer price index for truck transportation in the revised econometric model); Sumner & Pouliot (2014), at 110-11 (Exhibit US-35) (analyzing data between September 2005 and December 2010, Sumner and Pouliot included variables controlling for exchange rates, price of barley in Alberta, price of corn in Nebraska, monthly price index for truck transportation, unemployment rates, seasonality, holidays including Independence Day, Thanksgiving and Christmas, and Canada's new specified risk materials (SRM) rule. Sumner and Pouliot note that their model does not include other relevant variables, including inventory levels due to insufficient data).

[116] Canada Written 22.6 Submission, para. 31.

[117] Canada Written 22.6 Submission, para. 30.

[118] *See* U.S. Written 22.6 Submission (Canada), para. 99; U.S. Written 22.6 Submission (Mexico), para. 71.

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of U.S., Canadian, and Mexican livestock differently.[119] These variables are just the beginning. There are numerous differences between the pattern of trade in livestock in the United States, Mexico and Canada that should be controlled for in order to truly isolate the effects of the amended COOL measure. For instance, there are substantial differences in factors such as the number of head per sale, sorting of cattle by size versus mixed lots, relative herd inventories, type of sales contract, and sex of cattle. This is to reiterate that the North American livestock market is not uniform, and differences related to geography, local practices and other factors contribute to the price and quantity basis reported by Canada, and price basis reported by Mexico.

93.   <u>There are insufficient observations or data.</u> Second, econometric models are only as strong as the data they rely on. Even if Canada and Mexico sought to include all of the relevant variables, the nature of the North American livestock market renders it impossible to identify relevant data sources capable of controlling for these variables. As described in response to Question 9, Canada and Mexico's econometric modeling relies on weekly data. To the extent that data related to the omitted variables exists, it is typically monthly or quarterly. The process of translating this data to weekly data introduces significant errors and may render "significant" variables, insignificant.[120] In other cases, the data is simply not available.[121]

94.   In this instance, despite noting that relying on "actual" data is a strength, the accuracy of Canada and Mexico's estimates are undermined where they rely on unverified data. The use of the APHIS data by Canada and AMS pricing data by Mexico raises serious concerns as both introduce additional errors into an already problematic model specification.

95.   In conclusion with respect to the econometric modeling, the Canadian and Mexican approaches are inconsistent, fragmented, and opaque. In this regard, while it may be possible for Canada and Mexico to improve upon their modeling, the practical obstacles to doing so are numerous, which is why researchers have typically used the partial-equilibrium approach to examine these issues and not an econometric approach. That is, the complexity of the market results in numerous substantive factors needing to be included in the econometric models to control for their effects, and appropriate estimates of these variables are not readily (or even through manipulation) available. Even Canada and Mexico did not apply econometric approaches consistently to their estimations of the trade impact of the amended COOL measure.

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[119] For instances contrary to Canada's assertions (Canada Written 22.6 Submission, para. 40), it is broadly understood that the recent recession impacted the United States more severely than Canada. *See US – COOL (Article 21.5 – Canada/Mexico) (Panel)*, para. 7.189, n.453 (recognizing differences in unemployment rates). *See also* Sumner & Pouliot (2014), at 111, n.5 (Exh. US-35), (stating that they could have used "other variables to measure the relative strength of Canada and US economies. However, these variables are published infrequently (e.g. quarterly)").

[120] *See* Sumner & Pouliot (2014), 110-111 (Exh. US-35) (discussing issues with quarterly data and potential for bias). *See also* Written 22.6 Submission, para. 42, fn 53 (discussing difficultly translating time series data).

[121] As described in response to Question 9, including layered dummy variables will not provide accurate results.

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This fact alone demonstrates that in practice, the limitations of econometric estimation make it not a suitable tool for purposes of these arbitrations.

96.   Conversely, the EDM is an appropriate means of accurately estimating the impact of the amended COOL measure. In particular, the EDM approach takes as a given that there are numerous factors in addition to the amended COOL measure that affect the price and quantity of livestock traded. Rather than construct an estimate for each variable over a ten year period, which as described above compounds the errors and bias introduced into the model, the EDM seeks to isolate the amended COOL measure's compliance costs and estimate the effect of removing those costs in the context of the interrelated supply, demand, and trade relationships within and among the livestock and meat sectors along the entire supply chain from farm production through retail sale.

97.   The EDM utilizes 2014 as its base year and assumes all factors, input prices, consumer interests, and other variables are held constant. Given that the original COOL measure had been in place for six years and the amended COOL measure for only two years, the EDM is more suitable to answer the question: what would be the impact on trade and prices of removing the costs of the amended COOL measure relative to the current situation with the amended COOL measure in place, given that trade between Canada, Mexico, and the United States is linked and given that those products interact across sectors through retail consumer preferences. To this end, the EDM provides a clearer and more succinct estimate of the impact on trade in 2015. The econometric approach cannot provide such a consistent approach, which is why Canada and Mexico use different approaches for different sectors.

98.   Finally, the United States would note that Canada and Mexico's assertion that equilibrium displacement modeling is only useful for *ex ante* analysis is a red herring.[122] First, partial equilibrium models (such as the EDM) are used to analyze the impact of a wide variety of policies both *ex ante* and *ex post*. Canada and Mexico cite two studies of the COOL measure conducted prior to its implementation as evidence, but ignores subsequent *ex post* analysis of the COOL measure,[123] and numerous other *ex post* EDM studies in the academic literature, including those conducted by Dr. Sumner.[124] Canada and Mexico reason that econometric models are

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[122] Canada Written 22.6 Submission, para. 63; Mexico Written 22.6 Submission, para. 20.

[123] Glynn Tonsor, Ted Schroeder, and Joe Parcell, *Economic Impacts of 2009 and 2013 U.S. Country-of-Origin Labeling Rules on U.S. Beef and Pork Market,* Kansas State University Project Number AG-3142-P-14-0054 R0 (2015) (MEX–Appendix 15).

[124] *See, e.g.,* Bradley J. Rickard & Daniel A. Sumner, *Domestic support and border measures for processed horticultural products,* AM. J. OF AGRIC. ECON. 90(1), 55-68 (Feb. 2008) (Exhibit US-10); Daniel A. Sumner & Michael K. Wohlgenant, *Effects of an increase in the federal excise tax on cigarettes,* AM. J. OF AGRIC. ECON. 67(2), 235-242 (May 1985) (Exhibit US-11); Ted C. Schroeder & Glynn T. Tonsor, *Economic impact of Zilmax adoption in cattle feeding,* J. OF AGRIC. & RESOURCE ECON. 36(3), 521-535 (Dec. 2011) (Exhibit US-17); William Deese & John Reeder, *Export taxes on agricultural products: recent history and economic modeling of soybean export taxes in Argentina,* J. OF INT'L COM. & ECON. (Sept. 2007) (Exhibit US-20); Joao E. Mutondo, B. Wade Brorsen, & Shida R. Henneberry, *Welfare Impacts of BSE-Driven Trade Bans,* Ag. and Resource Econ. Review, 38/3 (Dec. 2009), 324-329 (Exhibit US-49); Xueyan Zhao, J.D. Mullen, G.R. Griffith, W.E. Giffiths, & R.R.

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more appropriate in *ex post* analysis "when data are available."[125] This statement misrepresents the availability and use of data. As noted above, it is the lack of accurate estimates of the omitted variables, due in part to omitted variables bias, that renders the econometric analysis supported by Canada and Mexico unable to provide an estimate of the level of nullification or impairment. On the other hand, the EDM utilizes complete and verified U.S. Census Bureau trade data for 2014 as its baseline. These are observed actual results. Further, the EDM uses compliance cost estimates that are based on extensive studies and commented-upon USDA analysis. Thus, the EDM relies on the data that is available, rather than discrediting or denying the impact of other relevant causal factors based on economic theory with little to no evidence.

99.   Furthermore, an econometric approach as used by Canada and Mexico is fundamentally unsuited to answer the question about what would happen to prices and trade between the three countries tomorrow if COOL requirements were removed today. The EDM approach, on the other hand, like many of the cited studies, considers both *ex ante* and *ex post* periods. That is, the EDM uses actual observed data for the 2014 baseline. The EDM then allows the question to be answered, *ex post*, what would be the effects of removing the costs of COOL compliance? The EDM is more appropriate for answering this question as it handles all of the relevant sectors and segments of the livestock and meat supply chains within one consistent framework. The EDM is transparent and is calibrated to the current market conditions as they actually exist given the presence of the amended COOL measure.

26.   ***United States***: **The original panel and the Article 21.5 panel found respectively that "the [original] COOL measure creates an incentive to use domestic livestock ... by imposing higher segregation costs on imported livestock than on domestic livestock"[126], and "the amended COOL measure creates an increased incentive in favour of processing exclusively domestic livestock."[127] Please explain why differential compliance costs, including segregation costs, were not accounted for in the EDM proposed by the United States, with respect both to specification of the equations and inclusion of the costs in the data inputs.**

100.   As described in the U.S. Written 22.6 Submission,[128] the Regulatory Impact Analysis (RIA) costs were developed with the understanding that all entities, whether in the United States or elsewhere, would face similar tasks and direct costs regardless of their location (*e.g.*, the cost of recordkeeping in the United States is similar to the cost of recordkeeping in Canada). These costs were subject to review and comment on numerous occasions, and are the best estimate of

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Piggott, *An Equilibrium Displacement Model of the Australian Beef Industry,* Economic Research Report No. 4 (Dec. 2000) (Exhibit US-50).

[125] Mexico Written 22.6 Submission, para. 20.

[126] Panel Reports, *US – COOL*, para. 7.372; *see also* Appellate Body Reports, *US – COOL*, para. 292.

[127] Panel Reports, *US – COOL (Article 21.5 – Canada and Mexico)*, para. 7.176.

[128] U.S. Written 22.6 Submission (Mexico), paras. 48-55; US Written 22.6 Submission (Canada), paras. 48-55.

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the costs associated with the amended COOL measure. Despite imposing equivalent direct costs drawn from the RIA, the EDM recognizes (and structurally can model) differential impacts are present. The EDM imposes different elasticities for imported and domestic livestock. In particular, the import supply elasticities translate into a differential and more severe impact on imported livestock.[129] This difference reflects the differential compliance costs imposed on Canadian and Mexican livestock suppliers.

101.   Recognizing that the panel and compliance panels have found that some portion of U.S. costs may be shifted up the supply chain and imposed on importers, the United States has sought empirical evidence of this differential impact. However, there are no verifiable or reliable sources of cost data that provide an estimate of the differential cost. As the Arbitrators are aware and as cited by Canada and Mexico, the Informa Economics Report does purport to provide this sort of information.[130] In the original proceeding, the panel concluded that the Informa Report demonstrates that compliance costs "depend on a large number of determinants, including the decision to process only US-origin or mixed-origin products, the stage of the supply chain, the size of the firm, the geographical location of operators and the time of the year," and that "COOL costs arise at every stage of the livestock and meat supply chain, and that these costs increase as livestock and meat move downstream on the chain."[131] Further, the panel noted that the "Informa Report is silent on its methodology and the sample considered (*i.e.*, time period, geographical zone, number of firms surveyed)," and thus is not "reliable and precise as regards its exact quantification of the costs of the COOL measure."[132]

102.   It is clear that the Informa Report provides a gross exaggeration of the compliance costs for mixed origin product. The Informa Report contends that the costs of complying with COOL are 30-40 times higher for packers/retailers that process both domestic and foreign origin livestock compared with those that process only domestic livestock. However, were this the case, this level of additional costs would render it prohibitively expensive for any company to continue to process imported Canadian or Mexican animals – or Canadian or Mexican ranchers to continue to supply such livestock. Yet, as the data demonstrates, Canadian and Mexican cattle exports continued throughout the period of review and in 2014 were close to record highs.[133]

103.   As a result, the United States was unable to rely on the Informa Report for purposes of the EDM. The United States continues to not endorse the compliance costs as described in the Informa Report. However, in response to the Arbitrators' question, the United States has sought to make some use of the Informa Report to describe the extreme upward bound on any costs

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[129] U.S. Written 22.6 Submission (Canada), para. 57, U.S. Written 22.6 Submission (Mexico), para. 56-58.

[130] *See* Informa Economics (Exhibits CDA-64; CDA-55(22.6); MEX-9).

[131] *US – COOL (Panel)*, para. 7.498.

[132] *US – COOL (Panel)*, para. 7.499.

[133] Exhibit US-5, Trade Data.

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differentials, recognizing the lack of other data.[134] In so doing, the United States has not attempted to correct certain obvious logical errors and overestimations in the Informa Report cost estimates themselves, but rather addressed their logical application within the system. Even with these corrections, use of the Informa Report numbers will produce a conservative estimate of trade effects based on these differential costs that will be on the high side.

104.　To operationalize those cattle and hog Informa costs in a rational manner, the revised cost wedge assumes that no retailer would purchase beef or pork with any imported content unless it was as or less expensive than meat from animals born and raised in the United States ("domestic meat"). That is, any extra cost associated with the imported product would not be paid by the retailer, but rather would be passed up the supply chain. This self-granted discount reflects the difference between the costs of exclusively domestic meat and mixed-source meat. In Informa terms, this means retailers would demand that imported wholesale beef be discounted by $0.0285 per retail pound ($0.0290 per pound retail weight minus $0.0005 per pound retail weight). For pork that would be $0.0017 per pound retail weight (due to rounding) ($0.0020 per pound retail weight minus $0.0002 per pound retail weight).

105.　Similarly, U.S. packers who buy imported slaughter animals will refuse to pay for any differential costs. According to Informa, these packers are also going to face higher costs for dealing with these imported animals. However, cost wedge recognizes, in line with economic theory that these packers will insist on a price discount on the imported livestock. Informa estimated that it would cost $6 and $18.00 per head more to deal with imported hogs and steers, respectively. When the retail-level discounts are added to the packer level discounts the total is $6.28 for "imported" hogs and $34.36 for "imported" cattle. "Imported" is in quotes in the previous sentence as this cost wedge applies this discount to animals that are actually imported directly for slaughter as well as those coming from imported feeders sold by U.S. finishers. Finishers have higher costs of dealing with mixed-origin animals and will get a lower price for the animals from imported feeders. The net discounts are $6.78 and $35.11 per head for feeder pigs and calves.

106.　In this context, the cost wedge is inputted into the EDM described in the U.S. Written 22.6 Submissions and follows its previous precedent with respect to exempt products and firms in developing the scenarios – it multiplies the retail COOL costs per pound times the percentage of product that has to be labeled. It also assumes at this point that all livestock has to be pre-labeled and all wholesale meat is labeled.

107.　Under this estimated cost wedge, U.S. retailers, packers, and feeders directly pay for the costs of dealing with imported meat and livestock. However, this cost wedge provides that all the differential costs of the amended COOL measure are borne by firms in the source countries.

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[134] Tonsor, et al. (2015), 47 (MEX Appendix-15) (noting that "we rely on the cost impacts from Informa (2010) for two main reasons: 1) the Informa estimates are the most complete and extensive set of cost estimates available; and 2) the Informa estimates are the only source we are aware of that provide cost estimates separately by market level which is needed to operationalize our EDMs").

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Note that the Informa-based scenarios have low to no costs for people dealing with exclusively domestic animals and meat.

Derived Informa Report-Based Cost Wedges

	Domestic COOL		Import price wedge		
	Pork	Beef	Pork	Beef	Unit
Farm	$0.0000	$0.2500	$6.7777	$35.1109	Dollar per head
Finishing	$0.0000	$0.2500	$6.2777	$34.3609	Dollar per head
Packer	$0.0000	$0.0004	$0.0017	$0.0285	Dollars per pound retail weight
Retailer	$0.0002	$0.0005			Dollars per pound retail weight

108. To recap, if the Informa costs, which as discussed above are unverified and excessive, were used to review a differential cost impact, then the import price wedge would be the difference between the costs for domestic meat and the costs for mixed-origin meat from Informa when the costs are paid by entities in the source country (Canada or Mexico). It is relevant to note that since the Informa costs clearly assessed only the implementation period with substantial fixed costs, the short-run elasticity is again appropriate.[135] Results from this upward estimation of differential costs are presented in the table below.

Estimated Trade Effects with Short-Term Adjusted Informa Costs

Product	Estimated Increase in Export over 2014 (export value, millions of dollars)
Canada's feeder pig export values	$62.30
Canada's slaughter hog export value	$5.10
Canada's feeder calf export values	$34.30
Canada's slaughter/fed cattle export values	$27.01
Mexico's feeder calf export values	$78.95

27. *United States*: **What is the justification for relying on short-run elasticities rather than long-run elasticities? In this connection, please comment on the relevance of the length of time during which the measures have been in place, and the United States' assumption of full equilibrium after the withdrawal of the COOL measure.**

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[135] The United States notes that this evaluation of the Informa cost data is a high-end estimate. As noted by the panels, the Informa data was not subject to rigorous review, and reflects a very early understanding of implementation costs. To utilize the Informa costs with a longer run elasticity would require a review and segregation of fixed and variable costs to avoid compounding the already substantial overestimation of compliance costs.

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109.   The U.S. EDM uses short-run elasticities drawn from peer-reviewed literature. In this context, short-run is typically defined as one to two years, while long run is defined as ten years.[136] In particular, this assumes full adjustment to a new policy in the cattle sector will require ten years.[137]

110.   The initial COOL measure has been in effect since 2009 (approximately six years), and the amended COOL measure has been in effect since 2013 (two years). Thus, in terms of economic theory, the market has yet to completely adjust to the measure's requirements. This renders the short-term elasticities more appropriate.

111.   Moreover, the RIA cost wedges used in the U.S. EDM reflect costs during the implementation period. That is, the cost are those expected in year one and contain fixed costs which will not be present in the long-run (such as buying new equipment, revising software, and establishing new procedures). While estimates of sector-by-sector and segment-by-segment incremental costs over time are not available, one would expect those costs to be significantly smaller than initial implementation costs. To simulate the removal of a policy action that has been in effect for a short period necessitates using short-run elasticities.

112.   For these reasons, it would be appropriate to use a short-run elasticity to match the implementation timeframe for the amended COOL measure.

28.   *United States*: Rather than specify a single elasticity value, could the United States provide a range of values for the elasticities used in the EDM?

113.   The EDM presented by the United States utilizes elasticities drawn from peer-reviewed, academic literature. These elasticities are reported in the 2015 study conducted by Kansas State University economists, Glynn Tonsor, Ted Schroeder, and Joe Parcell.[138] Tonsor, et al. (2015)

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[136] Glynn Tonsor, Ted Schroeder, and Joe Parcell, *Economic Impacts of 2009 and 2013 U.S. Country-of-Origin Labeling Rules on U.S. Beef and Pork Market,* Kansas State University Project Number AG-3142-P-14-0054 R0 (2015), at 40-41 (MEX–Appendix 15) (hereinafter Tonsor, et al. (2015)). *See also* Gary W. Brester, John M. Marsh, & Joseph A. Atwood, *Distributional impacts of country-of-origin labeling in the U.S. meat industry,* J. OF AGRIC. & RES. ECON. 29(2), 217, 222 (2004) (hereinafter Brestor, Marsh & Atwood (2004)) (MEX-Appendix 4). *See also* John Marsh, *Cross-Sector Relationships Between the Corn Feed Grains and Livestock and Poultry,* J. Ag. and Resource Economics, 32(1):93-114 (2007), available: http://ageconsearch.umn.edu/bitstream/8595/1/32010093.pdf; W. Meyers, et al., FAPRI U.S. Agriculture Sector Elasticities, Technical Report (October 1992), available: http://www.card.iastate.edu/publications/dbs/pdffiles/92tr26.pdf.

[137] *Id.*

[138] Glynn Tonsor, Ted Schroeder, and Joe Parcell, *Economic Impacts of 2009 and 2013 U.S. Country-of-Origin Labeling Rules on U.S. Beef and Pork Market,* Kansas State University Project Number AG-3142-P-14-0054 R0 (2015), at 40 (MEX Appendix 15) (hereinafter Tonsor, et al. (2015)).

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provide a summary of the appropriate peer-reviewed short and long run elasticities at page 43 of their report.[139]

114.   As previously stated, Tonsor, et al. (2015) follow convention and define the short-run for the purposes of establishing elasticities as "Year 1" and the long-run as "Year 10." In that study, the model was run for all ten years, using elasticities that were linearly derived for years two through nine. Below we have followed this approach, using the peer-reviewed elasticities for years one and ten to produce a range of elasticities for years two through nine.

Own-price elasticities for retail meat demand[140]

Year	Pork	Beef
1	-0.69	-0.86
2	-0.72	-0.89
3	-0.76	-0.93
4	-0.79	-0.96
5	-0.83	-1.00
6	-0.86	-1.03
7	-0.90	-1.07
8	-0.93	-1.10
9	-0.97	-1.14
10	-1.00	-1.17

Feeder animal supply elasticities[141]

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[139] Tonsor, et al. (2015) at 35 (MEX Appendix 15) (noting that "[a] well-accepted and widely used approach in the agricultural economics literature is to estimate market effects of policy changes and/or technology adoption by developing and applying an equilibrium displacement model (*e.g.*, Balagtas and Kim, 2007; Brester, Marsh, and Atwood, 2004b; Lemieux and Wohlgenant, 1989; Lusk and Anderson, 2004; Pendell et al., 2010; Schroeder and Tonsor, 2011; Wohlgenant, 1993). *See also* Brestor, Marsh & Atwood (2004)) (MEX Appendix 4).

[140] The United States did not calculate a range for the cross-price elasticity of demand for retail beef and pork because the short-run and long-run elasticities are the same. *See* Tonsor, et al. (2015), Appendix Table I at page 7 (MEX Appendix 15).

[141] In the U.S. submissions (and exhibits for the EDM and the EDM guidebook), the U.S. presented supply elasticities for *slaughter* hogs and cattle, not feeder animals. This table presents supply elasticities for feeder pigs and feeder cattle. The Tonsor, et al. (2015) study included a supply elasticity for feeder cattle, but not for feeder pigs. The feeder pig elasticity was sourced from Wohlgenant. *See* Michael K. Wohlegnant, Market Modeling of the Effects of Adoption of New Swine Waste Management Technologies in North Carolina, Report for Smithfield Foods and North Carolina Attorney General (July 2005), at 56 (Exhibit US-30)),. Wohlgenant provides short-run (0.639) and long-run (2.61) supply elasticities for U.S. feeder pigs. The feeder pig supply elasticities are slightly more elastic than the KSU supply elasticities for slaughter hogs (0.41 and 1.80, respectively), while Tonsor, et al. (2015)'s supply elasticities for feeder cattle are slightly less elastic than those they used for slaughter cattle (0.26 and 3.24, respectively).

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Year	Pigs	Cattle
1	0.64	0.22
2	0.86	0.51
3	1.08	0.80
4	1.30	1.09
5	1.52	1.38
6	1.73	1.66
7	1.95	1.95
8	2.17	2.24
9	2.39	2.53
10	2.61	2.82

Wholesale meat elasticities[142]

	Year	Pork	Beef
Import supply	1	1.41	1.83
	2	2.36	2.74
	3	3.32	3.65
	4	4.27	4.55
	5	5.23	5.46
	6	6.18	6.37
	7	7.14	7.28
	8	8.09	8.18
	9	9.05	9.09
	10	10.00	10.00
Export demand	1	-0.89	-0.42
	2	-0.90	-0.71
	3	-0.91	-0.99
	4	-0.93	-1.28
	5	-0.94	-1.57
	6	-0.95	-1.85

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[142] As documented in the U.S. submissions and exhibits, there is no consistent set of import supply elasticities for feeder and slaughter animals. As such, the U.S. EDM set those elasticities to the wholesale meat import supply elasticities for pork and beef. This likely overstates the long-run elasticity for these animals (meaning, they are more elastic). In a study of U.S. live hog and pork imports, Brandt et al. note that the supply elasticity of an exporting country is expected to be higher than that of the importing country. Mexico's calculation of an export supply elasticity of 4.0, as well as other studies (such as Muth, et al.), which uses an import supply elasticity of 1.3 for slaughter hogs, based on the assumption that the import supply is twice as elastic as domestic supply, suggest that a long-run elasticity of 10 for these animals is likely too high.

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	7	-0.96	-2.14
	8	-0.98	-2.43
	9	-0.99	-2.71
	10	-1.00	-3.00

29.   *Canada and Mexico*: **Canada submits that "[a] properly specified and calibrated simulation model could be developed and if applied correctly would show losses at least as large as those demonstrated by the Canadian Methodology Paper."[143] Would the EDM submitted by the United States be a sound approach if it: (a) correctly accounted for differentiating factors (such as origin of the product), and (b) used data inputs including segregation costs and long-run elasticities?**

4   **DATA**

30.   *All parties*: **The attached table sets out the baseline prices and quantities as used in the parties' respective calculations. Please comment on the differences between values computed in this table, and in particular:**

   a.   *Canada and the United States*: **Please comment on the discrepancies regarding "Imports of slaughter hogs from Canada".**

115.   As described in Exhibits US-3 and US-4,[144] the EDM uses official U.S. import data from January 1, 2014 through December 31, 2014 for the harmonized system (HS) codes reported by Canada for cattle and feeder hog exports. This import data is maintained by the U.S. Census Bureau. As indicated in Exhibits US-3 and US-4, the United States adjusted the import volume to reflect the actual volume of hogs for slaughter.

116.   For slaughter hogs, there is only one relevant HS code, 103920010. The United States understands that animals imported under this tariff line include barrows and gilts for immediate slaughter, but it also includes sows and boars. As noted in Canada's Methodology Paper, fed hogs are defined as barrows and gilts marketed for immediate slaughter.[145] The United States understands that barrows and gilts make up only about 40-50 percent of the hogs imported under this line.[146] Thus, while the United States reports that 763,767 fed pigs entered the United States

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[143] Canada's written submission, para. 93

[144] Exhibit US-3 worksheet "3. Import Volumes"; Exhibit US-4, page 2.

[145] Canada Methodology Paper, paras. 4 and 169.

[146] *See* the "2014 Annual LPGMN Statistics Summary" at page 15, *available*: http://www.ams.usda.gov/mnreports/lsancmtr.pdf. At the bottom of the table there are totals for barrows/gilts and sows/boars. In 2014, barrows and gilts made up 50 percent of the total; in 2013 they made up 44 percent of the total exports.

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in 2014, the EDM is calculated on the basis of only the barrows and gilts or 382,000 slaughter hogs for 2014. This is reflected in the relevant worksheets in the EDM.[147]

117. Conversely, Canada uses uncorrected weekly APHIS data for November 2013 through November 2014. As previously stated, this data is maintained to ensure that health certificates are in order, not to track import numbers for official purposes. Accordingly, its numbers are not official statistics and they differ from official U.S. census data. Despite recognized errors, because APHIS statistics are unofficial, they are never subject to publicly released corrections or revisions. On the other hand, the U.S. Census Bureau periodically revises its data and those revisions are made public. For that reason, only released monthly data is considered U.S. official import data for hogs. By utilizing unofficial and potentially incomplete weekly data, Canada's regression introduces inaccuracy or "noise" into the dataset, its econometric regressions, and its subsequent analysis.

> **b.** ***Mexico and the United States*: Please comment on the discrepancies regarding "Price of Mexican feeder calf from Mexico".**

118. As described above in response to Questions 6 and 16, there are serious concerns regarding the integrity of the data used by Mexico to calculate its baseline prices. The USDA AMS market news sources utilized by Mexico provide an unverified localized snapshot of cattle prices achieved through local auctions. They are not suitable for calculating unit values as they are not fully representative of all feeder animal imports from Mexico. For instance, they do not include established relationships or other direct contract sales.

119. Additionally, other sources support the U.S. Census data and not Mexico's baseline calculation.

Mexico's Estimated Baseline	$1.24 Billion	Calculated by multiplying the base price and base volume reported by Mexico on page 24 of Exhibit MEX-2.
U.S. Estimated Baseline	$736.48 Million	Calculated from U.S. Census Bureau Data.
Mexico's Reported Export Value	$749.46 million	GTIS, using data from INEGI - Instituto Nacional de Estadistica y Geografia[148]

<u>Note</u>: Mexico's official export data may not fully correspond to that from the U.S. submission because it is specified primarily at the 6-digit level, while the U.S. import data are at the 10-digit level. Therefore, this figure may include exports that would be considered outside the scope of

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[147] Exhibit US-3, Worksheets: "3. Import Volumes," "8. Baseline," "9. BaselineQ," "16. Complete Results," and implicitly in "1. Trade Shifts."

[148] *See* http://www.inegi.org.mx/.

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this dispute (*e.g.*, dairy cows, etc.). The HS codes used for Mexico's exports are HS 0102.29 and HS 0102.90. A list of HS codes used for the U.S. import value (and volumes) are listed in Exhibit US-4.

120.   Calculating a per unit export value using official Mexican government trade data from INEGI yields a result of $637.03, which is comparable to the U.S. per unit import value, $661.71 per head.

31.   *All parties*: Please provide updated data on: (a) the respective market shares of Canadian and Mexican exports of livestock in the US market; and (b) the respective shares of Canadian and Mexican livestock production that are exported to the United States.

121.   In tabs 1-3 of Exhibit US-51, the United States provides an estimate of Canadian and Mexican imports as a share of total U.S. slaughter. In tabs 3-6, the United States provides an estimate of Canadian and Mexican livestock exports as a share of total production in Canada or Mexico. We note that these estimates are based on the assumption that Canadian and Mexican exports are similar to U.S. imports of the relevant livestock.

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