

Changes with observed prices and quantities until 2009 and then model estimates from 2010

I estimate the price and quantities with the additional costs to the model estimates. These are compared with the model estimates and the observed data¹. After estimating prices, we correct for the share of the fed cattle meat and cull cow meat. That process will give us more precise estimates. Since we already have the future projected price, it is okay to correct for the shares. I believe this is justified to do it. We also compute the percentage changes in the price and quantity for fed cattle, cull cows as well as the aggregate producer surplus. The results are as follows:

Table 1: Percentage change in price of fed cattle

Year	percentChange_ps_obs	percentChange_ps_model
2010	-2.058	6.547
2011	-12.339	3.668
2012	-1.357	2.506
2013	3.168	3.573
2014	-14.713	2.713
2015	9.744	3.476
2016	29.665	3.266

Table 2: Percentage change in quantity of fed cattle

Year	percentChange_sl_obs	percentChange_sl_model
2010	-1.749	-2.249
2011	-0.547	-0.890
2012	-3.257	-0.531
2013	-1.152	-1.446
2014	-3.352	-0.872
2015	-3.064	-2.283
2016	-0.660	-1.895

Table 3: Percentage change in price of cull cows

Year	percentChange_pc_obs	percentChange_pc_model
2010	-28.411	-4.600
2011	-24.199	1.021
2012	-11.938	1.659
2013	-3.749	-0.674
2014	-24.573	0.625
2015	-1.142	-1.701
2016	33.532	-1.203

¹Note: Since we are using model estimates to project prices I believe we have to compare them with the same model estimates. For instance, model estimates at t should be used to get new estimates for t with added costs.

Table 4: Percentage change in quantity of cull cows

Year	percentChange_cl_obs	percentChange_cl_model
2010	16.893	17.571
2011	16.423	6.657
2012	12.124	3.673
2013	1.868	11.126
2014	21.826	6.253
2015	30.512	15.588
2016	26.235	13.214

Table 5: Aggregate producer surplus

Year	diffRevCost_t_obs	diffRevCost_t_model
2010	-1.8032	0.2071
2011	-4.3611	-0.0485
2012	-2.0766	-0.1489
2013	-0.2600	0.0755
2014	-6.8125	-0.0631
2015	2.0609	0.0895
2016	7.7899	0.0702

Changes with observed holding costs until 2009 and model holding costs with added costs from 2010 onwards. Observed fed cattle, cull cow prices, and quantities from beginning to end.

Table 6: Percentage change in price of fed cattle

Year	percentChange_ps_obs	percentChange_ps_model
2010	-5.913	2.353
2011	-14.319	1.326
2012	-3.081	0.714
2013	0.775	1.170
2014	-15.896	1.289
2015	6.274	0.204

Table 7: Percentage change in quantity of fed cattle

Year	percentChange_sl_obs	percentChange_sl_model
2010	-1.749	-2.249
2011	-0.547	-0.890
2012	-3.257	-0.531
2013	-1.152	-1.446
2014	-3.352	-0.872
2015	-3.065	-2.283

Table 8: Percentage change in price of cull cows

Year	percentChange_pc_obs	percentChange_pc_model
2010	-21.130	5.102
2011	-23.129	2.446
2012	-12.344	1.190
2013	-1.306	1.846
2014	-23.516	2.036
2015	0.879	0.308

Table 9: Percentage change in quantity of cull cows

Year	percentChange_cl_obs	percentChange_cl_model
2010	16.893	17.571
2011	16.423	6.657
2012	12.124	3.673
2013	1.868	11.126
2014	21.826	6.253
2015	30.514	15.589

Table 10: Aggregate producer surplus

Year	diffRevCost_t_obs	diffRevCost_t_model
2010	-2.4758	-0.4655
2011	-4.8548	-0.5422
2012	-2.5543	-0.6266
2013	-0.8415	-0.5060
2014	-7.1600	-0.4106
2015	1.1181	-0.8533

Changes with observed prices and quantities until 2009 and then model estimates from 2010. Here I am projecting the future prices and quantities with model estimates

Table 11: Percentage change in price of fed cattle

Year	percentChange_ps_obs	percentChange_ps_model
2010	-5.913	2.353
2011	-18.721	-3.879
2012	-16.553	-13.286
2013	-3.894	-3.518
2014	-15.549	1.706
2015	-11.858	-16.892
2016	34.699	7.275

Table 12: Percentage change in quantity of fed cattle

Year	percentChange_sl_obs	percentChange_sl_model
2010	-1.749	-2.249
2011	-4.412	-4.741
2012	-1.699	1.071
2013	2.013	1.711
2014	-2.025	0.490
2015	4.091	4.930
2016	-3.263	-4.465

Table 13: Percentage change in price of cull cows

Year	percentChange_pc_obs	percentChange_pc_model
2010	-21.130	5.102
2011	-45.056	-26.776
2012	-33.816	-23.597
2013	-12.277	-9.475
2014	-26.813	-2.363
2015	-21.591	-22.034
2016	37.425	1.678

Table 14: Percentage change in quantity of cull cows

Year	percentChange_cl_obs	percentChange_cl_model
2010	16.893	17.571
2011	19.732	9.689
2012	8.706	0.513
2013	8.207	18.041
2014	21.092	5.612
2015	20.854	7.034
2016	28.701	15.426

Table 15: Aggregate producer surplus

Year	diffRevCost_t_obs	diffRevCost_t_model
2010	-2.4758	-0.4655
2011	-7.3020	-2.9893
2012	-6.4745	-4.5468
2013	-1.4112	-1.0758
2014	-6.7984	-0.0489
2015	-3.2772	-5.2486
2016	8.3218	0.6021