# 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 data[1]. 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 a 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 |

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[1]Note: 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 $t$ shoud 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 begining 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 |

**Changes with observed prices and quantities with added costs.**

Table 16: Percentage change in price of fed cattle

| Year | percentChange_ps_obs | percentChange_ps_model |
|------|----------------------|------------------------|
| 2010 | -5.913 | 2.353 |
| 2011 | -13.635 | 2.135 |
| 2012 | -2.024 | 1.812 |
| 2013 | 1.276 | 1.672 |
| 2014 | -15.625 | 1.614 |
| 2015 | 7.426 | 1.291 |
| 2016 | 27.201 | 1.304 |

Table 17: 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 18: Percentage change in price of cull cows

| Year | percentChange_pc_obs | percentChange_pc_model |
|------|----------------------|------------------------|
| 2010 | -21.130 | 5.102 |
| 2011 | -22.009 | 3.938 |
| 2012 | -10.757 | 3.022 |
| 2013 | -0.537 | 2.639 |
| 2014 | -23.130 | 2.550 |
| 2015 | 2.532 | 1.953 |
| 2016 | 37.817 | 1.968 |

Table 19: 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 20: Aggregate producer surplus

| Year | diffRevCost_t_obs | diffRevCost_t_model |
|------|-------------------|---------------------|
| 2010 | -2.4758 | -0.4655 |
| 2011 | -4.6500 | -0.3373 |
| 2012 | -2.2253 | -0.2975 |
| 2013 | -0.6869 | -0.3515 |
| 2014 | -7.0593 | -0.3099 |
| 2015 | 1.5133 | -0.4581 |
| 2016 | 7.2943 | -0.4254 |