HIGHLIGHTS

• Farm-gate prices in Manitoba have generally been increasing. However, after an adjustment for inflation, the prices show a general declining trend. Thus, farm prices, in general, are not increasing faster than inflation.

• For commodities outside the supply-managed sectors of poultry meat, eggs and dairy, the year-to-year variability of prices can vary from +20% to -20% (and the hog price variability has been at least twice as large).

• A comparison of overall farm output prices and overall farm input prices showed a decline in the so-called terms of trade in the early 2000s (i.e. input prices increased faster than output prices) but there was an increase in the terms of trade up to mid-2013.

• The price of hogs relative to the price of barley shows a flat trend over the 1985 to 2013 period but the fluctuations in the ratio were often more than 40%.

• The price of wheat relative to the price of crude oil is now less (although very variable) compared to the calculation for the 1980s and the 1990s.

WHY AGRICULTURAL PRICE CHANGE?

Agriculture is an important sector in rural Manitoba. On-going mechanization (i.e., the use of larger machines) means that there is a declining number of people employed on farms in Manitoba. However, price trends drive many decisions:

1. if input prices are going up relative to output prices, the “cost-price squeeze” forces farmers to increase yields or lower costs in order to stay in business; whereas

2. if output prices are going up faster than input prices, farmers have more cash flow to make investments; and

3. another aspect of agricultural price change is that, if prices are more variable, there is greater uncertainty in being able to generate the cash flow to meet bills for expenditures as they come due.

The objective of this Factsheet is to show the trends – and the ups and the downs – in the prices of agricultural commodities.

We show the data for:

• nominal prices (without an adjustment for inflation);

• real prices (adjusted for inflation using the Consumer Price Index); and for a few cases

• the trend in the output price per dollar of input prices (using either a key input price, such as the hog/barley price ratio for hogs, or using a price index for a basket of outputs divided by the price index for a basket of inputs). Trade analysts define this as the “terms of trade” – is the selling price (for outputs) going up faster or slower than the buying price (for inputs)?

FINDINGS

Over time, the prices of farm products in Manitoba have generally increased, in nominal terms (i.e. before adjusting for inflation) (Figure 1).
However, there have been wide fluctuations in farm product prices. We might note the following peaks:

- August, 1973, due to a leap in the price of wheat;
- July, 1996, due to peaks in wheat, canola, potatoes and hogs that all occurred in the June to September period in 1996;
- July, 2008, due to peaks in wheat and canola. Potatoes and cattle and calves peaked in September, 2008 and hogs peaked in February, 2009; and, most recently

These prices indicate “incentives” to invest – they do not necessarily indicate that more cash was received by farmers as often the reason for a temporary price peak is that farmers have little to sell during that month.

**PRICE TRENDS ADJUSTED FOR INFLATION**

However, when we adjust the farm-gate prices for inflation¹, the overall level of farm prices in Manitoba was decreasing from the mid-1970s to the early 1990s and since then, farm-gate prices have generally followed the level of inflation, but with fluctuations (Figure 2).

*Figure 2. Manitoba Farm Product Price Index, All commodities, relative to CPI*

To illustrate the degree of variability or fluctuations in agricultural prices, we have taken the monthly Manitoba Farm Product Price Index and calculated, for the period since 1985, the percent change in price for a given month, compared to the same month in the previous year².

We see 5 periods where the index for all farm prices was declining (i.e. the bars in the chart are below zero) for consecutive months (Figure 3):

- January, 1985 to December, 1987 (except for two months);
- August, 1989 to July, 1992 (except for two months);
- October, 1996 to June, 2000 (except for three months);
- June, 2003 to May, 2006 (except for 10 months);
- April, 2009 to June, 2010; and
- another price decline that has started in September, 2013.

*Figure 3. In December, 2013, the Manitoba Farm Product Price Index (across all commodities) was down 11% compared to the same month to the previous year*

Similarly, we see 5 periods where the index for all farm prices was increasing for consecutive months:

- January, 1988 to July, 1989;
- August, 1992 to September, 1996 (except for 2 months);

¹. The Consumer Price Index is used to adjust for inflation.
². To calculate the percent change, we have used the difference in logarithms. This generates the same percent change for a given absolute positive or negative change. For example, if I ate 3 cookies yesterday and 6 cookies today, our usual arithmetic would show an increase of 100%. If I then eat 3 cookies tomorrow, that is a decline of 50%. By using the difference of logarithms to calculate the percent change, the change of 3 cookies is calculated relative to the geometric mean of 3 and 6 and thus the calculation shows an increase of 69.3% if my consumption increases from 3 to 6 cookies and a decline of 69.3% if there is a decline from 6 to 3 cookies.
• July, 2000 to May, 2003;
• June 2006 to March, 2009; and
• July, 2010 to August, 2013 (except for two months).

Note that output prices have been dropping since September, 2013.

There is an old adage among old agricultural economists – “the solution to high prices is high prices.” This means that in agriculture, higher world-wide prices generate more world-wide production which always has reduced prices. John Morriss in the January 23, 2014 issue of The Manitoba Co-operator3 makes the same point. He noted that in 1972, we heard that it was “different this time.” Then, in each brief price rally – 1980, 1985, 1993, 1996, 2006 and then in 2012-13 – we heard this “The world’s population is growing. It’s getting more affluent, so people will eat more meat. They aren’t making any more land.”

He concludes with the observation “Next time you hear that it’s different this time, remember – it won’t be.”

PRICE TRENDS BY COMMODITY GROUP

For the period 1985 to date, the pattern of agricultural price change by commodity group is presented in the charts in Appendix A. To summarize:

• Crop prices since 1985 have shown no up-ward or down-ward trend, relative to inflation (Appendix A Figures A3, A5, A7, A9 and A11);

• However, the variation of prices in this no-trend scenario is large. Year-to-year price changes of +20% or -20% are ‘typical’ (Appendix A Figures A4, A6, A8, A10 and A12);

• The prices of livestock and animal products have shown a general decline in prices, relative to inflation, since 1985 (Appendix A Figures A13, A15, A17, A19 and A21). The exception is the farm-gate price of milk which shows a generally flat trend in Appendix A Figure A23 which means the prices have generally been increasing with the rate of inflation. Relative to inflation, there was a slight relative decline up to the early 1990s, a slight relative increase up to the mid-2000s and the trend in the farm gate milk price has been flat (i.e. increasing with inflation) since the end of 2007;

• The supply management system for poultry meat, eggs and milk has muted the farm-gate price variability (Appendix A Figures A20, A22 and A24);

• The price fluctuation for cattle and calves has reached both +20% and -20% in year-to-year changes since 1985 (Appendix A Figure A16); and

• The price for hogs shows much more variability. Since 1985, a year-to-year price change of +40% and -40% has occurred at least twice (Appendix A Figure A18).

OUTPUT PRICES RELATIVE TO INPUT PRICES

Above, we have adjusted output prices for the rate of inflation as one way to show the “relative” trend in output prices.

Here, we compare output prices to input prices to see whether the price of an agricultural product is increasing faster or slower than the prices of (selected) inputs to produce that product.

Both output prices and input prices peaked in the 3rd quarter of 2008, then declined up to the 4th quarter of 2009 and increased again up to 2013 (Figure 4). The most recent data for the Farm Input Price Index refers to the 3rd quarter of 2013.

FARM-LEVEL “TERMS OF TRADE”

By taking the ratio of the Farm Output Price Index divided by the Farm Input Price Index, we can

calculate the farm-level “terms of trade.” This ratio indicates whether farm output prices are increasing or decreasing relative to farm input prices (Figure 5).

**Figure 5. Agriculture terms of trade: Output prices relative to input prices, Manitoba**

Output prices, relative to input prices, in Manitoba agriculture declined from 2002 to the 2nd quarter of 2006, temporarily peaked in the 3rd quarter of 2007, declined again to the 3rd quarter of 2009 before increasing and plateauing from the 3rd quarter of 2011 to the 2nd quarter of 2013. Recall that an increase in output prices relative to input prices provides farmers with some leeway in their investment decisions. However, another relative decline in output prices has started in the 3rd quarter of 2013.

We now explore whether the price of a selected commodity is increasing or decreasing relative to the price of a major input used to produce the commodity.

The variation in wheat prices (Appendix B Figure B1) may be compared with the variation in fertilizer prices (Appendix B Figure B2). When we look at the ratio of wheat prices divided by fertilizer prices, the so-called ‘terms of trade’ have varied over time (Figure 6). There was a general decline in the early 2000s, a spike in the 1st quarter in 2008 before a sharp decline to the 4th quarter of 2008 followed by somewhat of an increase to 2013. Again, the variability, rather than the trend, may be the major observation here.

**Figure 6. Ratio of wheat price to fertilizer price (2010=100), Canada**

Feed grain is a major input in hog production – and it is an input with a fluctuating price. The variation in the price of Manitoba hogs is shown in Appendix B Figure B3 and the variation in the price of Manitoba barley (a major feed grain) is shown in Appendix B Figure B4. When we calculate the ratio of the price of hogs to the price of barley to see whether the price of hogs is going up or down relative to the price of barley, we find virtually no trend but very wide fluctuations in the ratio (Figure 7). The wide variations in the hog / barley price ratio are an amplification of the variability in the hog price (Appendix B Figure B3) and the variability in the price of barley (Appendix B Figure B4).

**Figure 7. Hog/barley price ratio, Manitoba**

5. These observations are relevant to the request by farmers for a price insurance program and the recent willingness of the Government of Manitoba to participate in a pilot project to evaluate such a program – see “Manitoba joins the livestock price insurance club,” Manitoba Co-operator, February 26, 2014 (http://www.manitobacooperator.ca/2014/02/26/manitoba-joins-the-livestock-price-insurance-club/).

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4. This decline has continued in the 4th quarter of 2013 as portrayed in Figures 1 and 3.
Finally, we compare the index of the price of wheat (Appendix B Figure B5) with the index of the price of crude oil (Appendix B Figure B6). Petroleum fuels farm machinery and also petroleum prices drive the price of fertilizer. Again, the result is a very variable chart of the relative prices (Figure 8). In the 1980s and the 1990s, the price of wheat relative to the price of crude oil fluctuated up and down by a factor of 4. Since 2000, the fluctuation has been "only" (!) a factor of 2.5. Perhaps one observation is that the price of wheat, relative to the price of crude oil, appears to be lower in the 2000s than in the 1980s and 1990s.

**Figure 8.** Price of wheat relative to price of crude oil became lower and remained lower after 2000, Canada

A comparison of overall farm output prices and an overall farm input prices showed a decline in the so-called terms of trade in the early 2000s (i.e. input prices increased faster than output prices) but there was an increase in the terms of trade up to mid-2013.

The price of hogs relative to the price of barley shows a flat trend over the 1985 to 2013 period but the fluctuations in the ratio were often more than 40%.

The price of wheat relative to the price of crude oil is now less (although very variable) compared to the calculation for the 1980s and the 1990s.

Certainly, it is an advantage to farmers if their ‘terms of trade’ are moving in their favour (i.e. output prices increasing faster than input prices). When the cost-price squeeze re-appears (i.e. input prices are increasing faster than output prices), farmer need to increase yields (more bushels per acre, more pounds of pork marketed per sow, etc.) and / or they need to reduce costs in order to stay in business.

**FURTHER RESEARCH QUESTIONS**

- What effect does the exchange rate with the United States and corn prices have on agricultural price change?

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**SUMMARY**

Although employment change in agriculture is driven more by the rate of adoption of larger machines, the change in prices in agriculture is an indicator of the leeway or financial capacity for farmers to make investments.

Farm-gate prices in Manitoba have generally been increasing, but after an adjustment for inflation, the prices have generally been declining relative to the pace of inflation.

For commodities outside the supply-managed sectors of poultry meat, eggs and dairy, the year-to-year variability of prices can vary from +20% to -20% (and the hog price variability has been at least twice as large).

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6. Given the connection between the price of crude oil and the price of fertilizer, the 2002 to 2013 pattern in Figure 8 is essentially the same pattern as the pattern for 2002 to 2013 in Figure 6. The data in Figure 6 are quarterly averages (i.e. 3-month averages) whereas monthly data are shown in Figure 8.

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**APPENDIX A SUPPLEMENTARY CHARTS: MANITOBA FARM PRODUCT PRICE INDEX**

**Figure A1.** Manitoba Farm Product Price Index, All commodities, relative to CPI*

![Chart A1](chart1.png)

* Farm Product Price Index for given commodity (2006=100) divided by Consumer Price Index (2006=100)

Source: Statistics Canada. Farm Product Price Index. CANMMR Table 050-0001

**Figure A2.** In December, 2013, the Manitoba Farm Product Price Index (across all commodities) was down 11%, compared to the same month in the previous year

![Chart A2](chart2.png)

Source: Statistics Canada. Farm Product Price Index. CANMMR Table 050-0001

**Figure A3.** Manitoba Farm Product Price Index, ALL CROPS, relative to CPI*

![Chart A3](chart3.png)

* Farm Product Price Index for given commodity (2006=100) divided by Consumer Price Index (2006=100)

Source: Statistics Canada. Farm Product Price Index. CANMMR Table 050-0001

**Figure A4.** In December, 2013, the ALL CROPS Farm Product Price Index was down 23%, compared to the same month in the previous year

![Chart A4](chart4.png)

Source: Statistics Canada. Farm Product Price Index. CANMMR Table 050-0001

**Figure A5.** Manitoba Farm Product Price Index, GRAINS, relative to CPI*

![Chart A5](chart5.png)

* Farm Product Price Index for given commodity (2006=100) divided by Consumer Price Index (2006=100)

Source: Statistics Canada. Farm Product Price Index. CANMMR Table 050-0001

**Figure A6.** In December, 2013, the GRAINS Farm Product Price Index was down 32%, compared to the same month in the previous year

![Chart A6](chart6.png)

Source: Statistics Canada. Farm Product Price Index. CANMMR Table 050-0001
Figure A7. Manitoba Farm Product Price Index, OILSEEDS, relative to CPI*

Figure A10. In December, 2013, the VEGETABLES (except potatoes) Farm Product Price Index was down 8%, compared to the same month in the previous year.

Figure A8. In December, 2013, the OILSEEDS Farm Product Price Index was down 20%, compared to the same month in the previous year.

Figure A11. Manitoba Farm Product Price Index, POTATOES, relative to CPI*

Figure A9. Manitoba Farm Product Price Index, VEGETABLES (except potatoes), relative to CPI*

Figure A12. In December, 2013, the POTATOES Farm Product Price Index was the same, compared to the same month in the previous year.

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* Farm Product Price Index for given commodity (2007=100) divided by Consumer Price Index (2007=100)
Source: Statistics Canada, Farm Product Price Index, CANSIM Table 082-0021

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* Farm Product Price Index for given commodity (2007=100) divided by Consumer Price Index (2007=100)
Source: Statistics Canada, Farm Product Price Index, CANSIM Table 082-0021

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* Farm Product Price Index for given commodity (2007=100) divided by Consumer Price Index (2007=100)
Source: Statistics Canada, Farm Product Price Index, CANSIM Table 082-0021

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* Farm Product Price Index for given commodity (2007=100) divided by Consumer Price Index (2007=100)
Source: Statistics Canada, Farm Product Price Index, CANSIM Table 082-0021
Figure A13. Manitoba Farm Product Price Index, LIVESTOCK & ANIMAL PRODUCTS, relative to CPI*

Figure A14. In December, 2013, the LIVESTOCK & ANIMAL PRODUCTS Farm Product Price Index was up 5%, compared to the same month in the previous year

Figure A15. Manitoba Farm Product Price Index, CATTLE & CALVES, relative to CPI*

Figure A16. In December, 2013, the CATTLE & CALVES Farm Product Price Index was up 8%, compared to the same month in the previous year

Figure A17. Manitoba Farm Product Price Index, HOGS, relative to CPI*

Figure A18. In December, 2013, the HOG Farm Product Price Index was up 2%, compared to the same month in the previous year
Figure A19. Manitoba Farm Product Price Index, POUlTRY MEAT, relative to CPI*

Figure A20. In December, 2013, the POUlTRY MEAT Farm Product Price Index was down 9%, compared to the same month in the previous year

Figure A21. Manitoba Farm Product Price Index, EGGS, relative to CPI*

Figure A22. In December, 2013, the EGGS Farm Product Price Index was down 2%, compared to the same month in the previous year

Figure A23. Manitoba Farm Product Price Index, DAIRY, relative to CPI*

Figure A24. In December, 2013, the DAIRY Farm Product Price Index was unchanged, compared to the same month in the previous year
APPENDIX B: SUPPLEMENTARY CHARTS: PRICES FOR CALCULATION OF PRICE RATIOS FOR DISCUSSION OF TERMS OF TRADE

Figure B1. Index of price of wheat (2010=100), Canada

Figure B2. Index of price of fertilizer (2010=100), Canada

Figure B3. Price of hogs (dollars per hundredweight), Manitoba

Figure B4. Price of barley (dollar per metric tonne), Manitoba

Figure B5. Index of price of wheat (2010=100), Canada

Figure B6. Index of price of crude oil (2010=100), Canada