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Chris Loewald and Rashad Cassim

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Enquiries
Head: Research Department
South African Reserve Bank
P O Box 427
Pretoria 0001

Tel. no.: +27 12 313-3911
0861 12 SARB (0861 12 7272)

Analysis and revisions to the food outlook based on the Disaggregated Inflation Model (DIM) – November 2016[1]

Janine Boshoff and Byron Botha

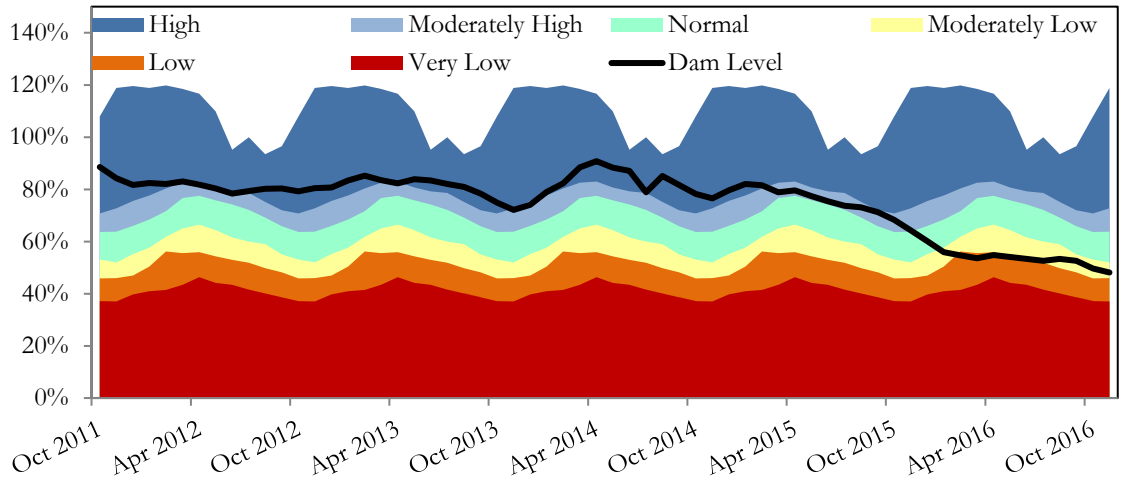
Abstract

In light of recent data outcomes and the importance of food in the calculation of headline consumer price inflation, it has been necessary to gain a deeper understanding of the dynamics in the agricultural sector following the recent drought. Approaching the problem on a disaggregated level we look at the industry category by category. The note concentrates on changes to the outlook on meat products in order to develop a view of food price inflation over the medium term. The analysis indicated that the timing and extent of the drought's impact on subcategories of Agricultural products differ significantly. This called for a revision to the forecast for the CPI Food basked, and as a result, the forecast prepared for the November 2016 MPC round differs significantly from the forecast prepared in September 2016. Finally, the impact of the current drought has been relatively muted when compared to historical drought periods.

Introduction

The South African agricultural sector experienced the lowest levels of rainfall[2] on record since 1904 over the 2015/16 season. Based on data collected by the Water and Sanitation department[3], dam levels across South Africa, Lesotho and Swaziland are at five year lows. A return to normal rainfall conditions in 2017 would likely have only a moderate impact in replenishing reservoirs, and the outlook suggests that dam levels will remain at historically low levels in the medium term, despite recent rains. While the impact of the drought has been pervasive, the extent and timing differs between the various subsectors of agriculture.

Figure 1. Historical dam level trends
Capacity (%)



[1] The authors would like to thank all the reviewers of this work as well Dineo Lekgeu and Jeffrey Rakgalakane for their contributions in particular. The outlook with respect to the tables and quoted figures represents the view presented at the November MPC while the graphs include the data updated with the October 2016 CPI release.
[2] Bureau for Food and Agricultural Policy (BFAP). (2016). *Agricultural Outlook 2016 – 2025*.
[3] Department of Water and Sanitation. (2016). National Integrated water information system. [Online]. Available: http://niwis.dwa.gov.za/niwis2/SurfaceWaterStorage. Accessed: 15 October 2016.

In determining the likely effects of the drought going forward, we must be cognisant of current weather developments, which will have a material impact on the production and price outlook. The reason for stressing the importance of weather conditions in the upcoming season is that the high ocean temperatures[4] that played a large role in causing the drought are known to decline quite rapidly after reaching a peak, thus oscillating from the warm El Niño to the cooler La Niña weather pattern. The South African Weather Service noted[5] that their forecasts for above average summer temperatures had subsided concurrently with expected wetter conditions over the early-to-midsummer period. Historical weather patterns notwithstanding, they cautioned that the lack of strong evidence of the development of La Niña to date casts considerable doubt on a favourable weather outlook. As a result, our baseline view is that South Africa will experience normal rainfall in the 2016/17 and 2017/18 seasons.

The rest of the note proceeds with a forecast of the inflation rate of the consumer food basket (CPI food inflation). The evolution of the food price forecast in 2016 represents a significant departure from previous forecasts, due largely to a change in the meat products inflation forecast which is subsequently examined. The primary interest is the ultimate effect of these changes on consumer prices and uncovering the dynamics of how the agricultural prices transmit to consumer prices.

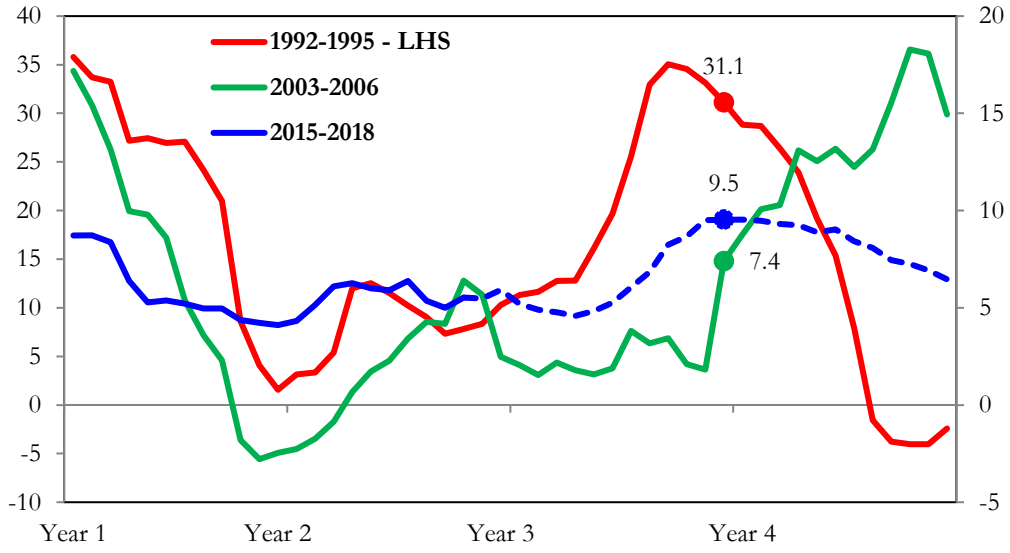
Overview and evolution of the food forecast

The food price outlook is sensitive to a number of assumptions concerning likely weather developments, the strategies and technologies available to farmers (in an ever changing, globalised world), and consumer preferences. We have used historical event data and relied on the analysis of agricultural organisations and think tanks to construct what we feel is the most likely drought recovery scenario given the data so far.

In the end however no two drought events are ever the same as consumers and producers can behave unpredictably, with small changes often having large impacts, and technology and agricultural policy continually altering the constraints of farmers[6]. Figure 2 shows the development of meat price inflation during various drought episodes in recent history. Particularly striking is the reduction of amplitude of the inflation, but similar dynamics in each drought episode. Thus, while there is enough regularity in the data to give some confidence to our forecast it is important to remember how quickly things can change. Should cattle farmers decide to take advantage of recent rains, for example, and start herd rebuilding early, meat prices pressures could shift forward and change the outlook quite dramatically.

[4] Measured by the Oceanic Niño Index (ONI).
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml
[5] Seasonal Climate Watch November 2016 to March 2017, Date: 20 October 2016.
http://www.weathersa.co.za/media/data/longrange/gfcsa/scw.pdf
[6] For example, the South African maize industry was deregulated in 1997 and the GMO Act introduced in the same year which opened the way for genetically modified mielies (making the crop more pest and drought resistant) resulting in much smaller price swings since the 2000s.

Figure 2. Meat prices following drought periods
Per cent (year-on-year)



This is essentially what has happened (albeit in reverse) from the previous to the current MPC, meat price pressures in the beginning of 2016 were expected to build up to the eventual peak, but ultimately fizzled out in the second half of the year. As a result meat now peaks in 2018Q1 at 9.5 per cent whereas it previously peaked at 9.9 per cent in 2017Q1. The complete results are summarised in Table 1.

Table 1. Disaggregated food price forecast November 2016 MPC vs September 2016 MPC

Forecast	Weight	2015	Q1	Q2	Q3	Q4	2016	Q1	Q2	Q3	Q4	2017	Q1	Q2	Q3	Q4	2018
Food and NAB	15.41	5.1	8.3	10.8	~~11.6~~	~~12.3~~	~~10.8~~	9.6	~~7.4~~	~~7.0~~	~~5.6~~	~~7.4~~	NA	NA	NA	NA	NA
					11.3	11.3	10.5	8.2	5.7	5.8	6.0	6.4	6.6	7.1	6.9	6.8	6.8
Meat	4.56	5.9	5.2	6.1	~~7.0~~	~~9.6~~	~~7.0~~	~~9.9~~	~~9.5~~	~~8.8~~	~~7.1~~	~~8.8~~	NA	NA	NA	NA	NA
					5.6	5.6	5.6	4.9	4.8	7.0	9.3	6.5	9.5	9.2	8.1	7.0	8.4
Bread and cereals	3.55	5.0	10.8	14.7	~~15.2~~	~~15.7~~	~~14.1~~	~~11.7~~	~~7.9~~	~~6.8~~	~~5.5~~	~~7.9~~	NA	NA	NA	NA	NA
					15.9	17.0	14.6	12.0	6.3	4.1	2.7	6.1	3.9	5.6	6.1	6.1	5.4
Dairy	1.74	6.1	~~2.7~~	~~6.7~~	~~9.9~~	~~11.8~~	~~7.8~~	~~12.1~~	~~8.7~~	~~6.7~~	~~5.8~~	~~8.2~~	NA	NA	NA	NA	NA
					9.6	10.9	7.5	11.1	7.7	5.9	5.6	7.5	6.2	7.3	7.6	7.7	7.2
Vegetables	1.61	0.8	~~18.1~~	~~20.9~~	~~15.6~~	~~11.9~~	~~16.6~~	~~2.2~~	~~0.3~~	~~6.2~~	~~4.0~~	~~3.1~~	NA	NA	NA	NA	NA
					15.0	10.1	16.0	-0.2	-2.2	4.2	5.4	1.7	5.7	5.5	5.2	5.2	5.4

As is evident from the table, the largest revision occurred to the meat category. Recent downward surprises called for additional research to be conducted into the trend of meat prices.

Meat

OECD-FAO[7] estimates indicate that global meat production is expected to expand by approximately 16 per cent over the 10-year forecast period. Global production has benefited from persistently low grain feed prices over the past three years. Conversely, the domestic livestock sector has been hampered by adverse weather conditions, while the recent currency depreciation means importing feed alternatives has

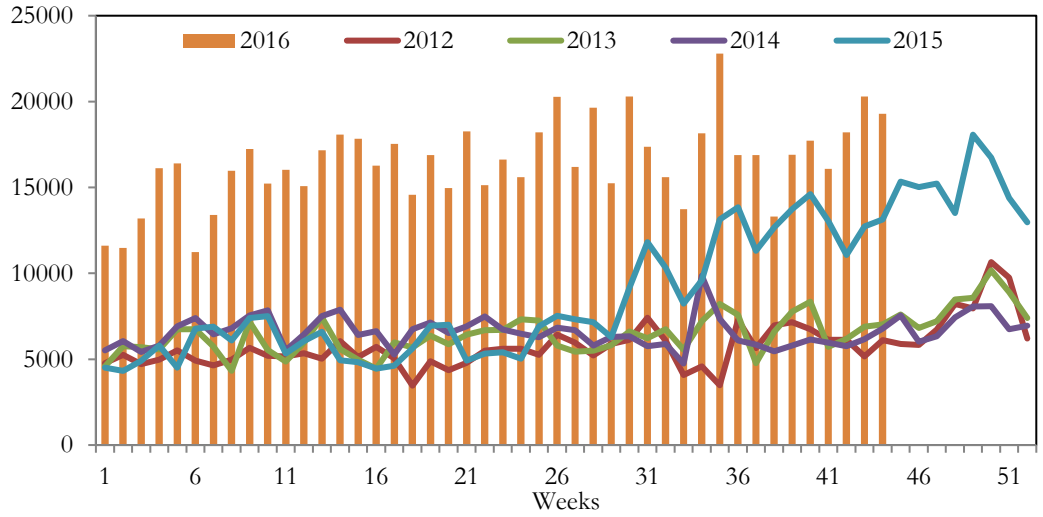
[7] Organisation for Economic Cooperation and Development & Food and Agriculture Organization of the United Nations (2015). "OECD-FAO Agricultural Outlook 2015". OECD Publishing, Paris.

become more costly. The impact of the 2015/16 drought has had a diverging impact on the livestock subsectors due to differences in production cycle length, feed use intensity, and price formation.

1. Beef production

Since the beef industry is largely dependent on grazing, it has been critically affected by the domestic drought conditions. In response, cattle slaughters numbers increased during the latter part of 2015 and cow herds are estimated to have declined by 15 per cent[8] compared to 2013 levels. Cattle slaughter trends have remained elevated during 2015 and 2016, and volumes have intensified further[9], well above those recorded in 2015.

Figure 3. Cattle slaughter trends
Heads of cattle



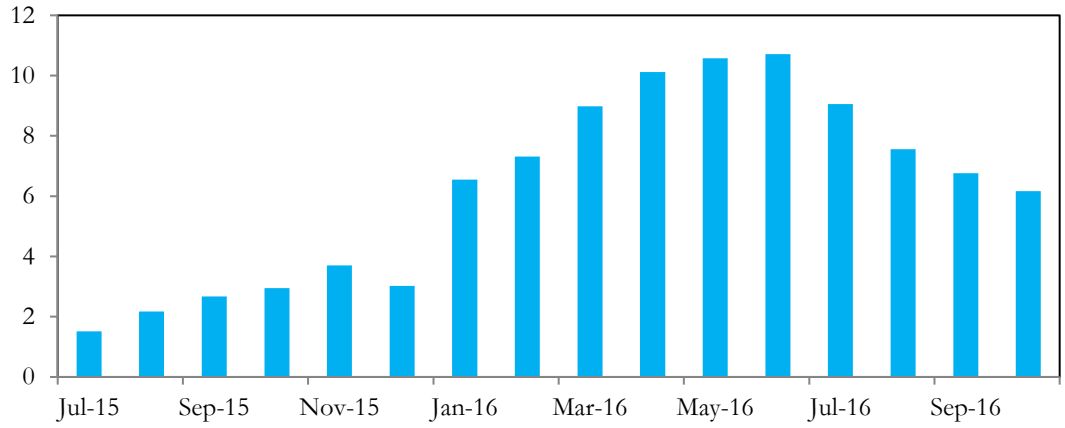
During previous drought episodes, herd liquidation resulted in lower beef prices in the short term, with a sharp uptick in prices when producers rebuilt herds later on. However, after South Africa regained its foot-and-mouth disease (FMD)-free status in 2014, red meat exports to Africa, Asia and the Middle East increased rapidly. Strong export demand, supported by the depreciation of the exchange rate, has limited the impact of domestic over-supply and supported average beef prices. As is evident from the graph below, domestic consumers have been facing consistently rising prices[10] since July 2015, despite slaughter volumes increasing by an estimated 9 per cent (BFAP, 2016).

[8] Bureau for Food and Agricultural Policy (2016). BFAP Baseline: Agricultural Outlook, 2016-2025. [Online]. Available at: http://www.bfap.co.za/documents/baselines/BFAP_Baseline_2016.pdf. Accessed on: 05 September 2016

[9] First National Bank (FNB). (2016). FNB Agri-Weekly. [Online]. Available: https://www.fnbagricomms.co.za/Agricweekly.aspx. Accessed: 16 November 2016.

[10] Statistics South Africa (2016).

Figure 4. Acceleration in CPI domestic beef prices
Year-on-year percentage change



The Red meat Producers Organisation (RPO)[11] suggest that national beef prices could increase by as much as 12 percent by the end of 2016, while the BFAP estimate that nominal prices will increase by an annual average of 5.8 per cent over the next decade. The change in export dynamics, in conjunction with higher maize feed prices, will cause a sharp increase in domestic prices when producers begin their herd rebuilding phase in 2017. Given the lengthy lifecycle of cattle production (approximately 4 years), domestic prices are expected to remain elevated, peaking in early-2018 before domestic supply stabilises in 2020. The BFAP (2016) have a similar price trajectory over their forecast period due to a reduction in slaughter volumes in 2017 and 2018.

2. Poultry production

The impact of the drought on production volumes has been less severe in the poultry industry. Intensive[12] use of feed grains[13] increased producer costs, but competitively priced imports have constrained the extent to which domestic producers can pass off costs to consumers.

The South African Poultry Association (SAPA) reported that imports increased by 21.6 per cent in 2015[14], and in fact, imports represent almost 23 per cent of domestic consumption (BFAP, 2016). Thus, domestic production volumes have held up well during the drought, but producer profits remain under pressure.

A return to normal weather conditions will produce a recovery in domestic production volumes by 2017, but the South African poultry market will continue to be characterised by a growing share of imported poultry. In an environment with stiff competition from importers (which may be exacerbated by the AGOA agreement), consumers will benefit from lower prices as domestic producers compete for market share.

[11] Farmer's Weekly (2016). Challenges and opportunities for SA's red meat producers. [Online]. Available at: http://www.farmersweekly.co.za/article.aspx?id=84461&h=Challenges-and-opportunities-for-SA%E2%80%99s-red-meat-producers. Accessed on: 17 October 2016.
[12] Feed costs account for 70 per cent of live bird costs.
[13] Parliamentary monitoring group (2016). Impact and Response to Current Drought. [Online]. Available at: https://pmg.org.za/committee-meeting/22102/. Accessed on: 17 October 2016.
[14] South African Poultry Association (2016). South African poultry meat imports: July 2016. [Online]. Available at: http://www.sapoultry.co.za/pdf-statistics/poultry-imports-report.pdf. Accessed on: 17 October 2016.

3. Pork production

Similar to the poultry industry, pork production systems are capital and feed intensive. Yellow maize composes the bulk of feeding systems[15], and producer profitability has been significantly impacted by the domestic drought.

While pork represents less than 8 per cent of meat consumption in South Africa, it remains an affordable alternative to both beef and lamb when consumed fresh. Processed pork, on the other hand, represents a high value-add category consumed predominantly by high income consumers where prices remain well supported despite the economic slowdown (BFAP, 2016).

Turning to the forecast, consumer prices are expected to peak in early 2018 as producers pass off some of the higher feed costs to the market. The spike in beef prices (due to herd rebuilding) in January 2018 will support pork prices as consumers opt to substitute to cheaper protein sources. Therefore, pork prices are set to remain elevated for the rest of the forecast period.

Since pork products make up the bulk of the dried, salted or smoked meat category, the DIM takes its cue from pork prices, adding on the premium for value-added in this category. The forecast for consumer prices of dried, salted and smoked meat is expected to peak in 2018, but remains elevated over the entire outlook.

4. Lamb and Mutton production

Production of lamb and mutton, which rely on a pasture based system, is very sensitive to weather conditions. South Africa imports a large proportion of its lamb products from New Zealand and Australia, meaning that market prices are affected by world price movements. Domestic producers with limited pastures have reduced their ewe flock, opting to retain younger replacement ewes for the rebuilding phase expected in 2017. The BFAP (2016) estimates that nominal lamb prices will increase by 5 per cent for 2016, led by import parity levels.

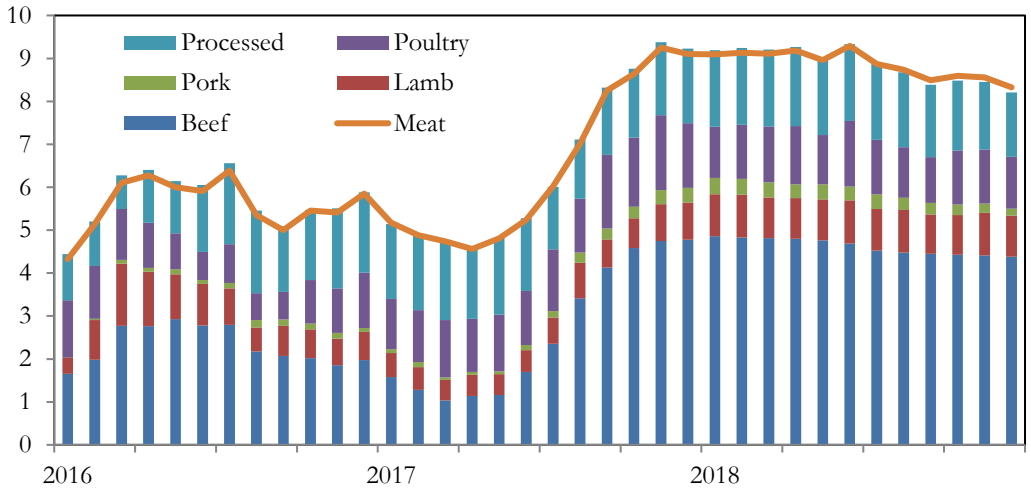
The production cycle for lamb and mutton is much shorter than that for beef, and an increase in production volumes are expected to occur in 2018 already. Once again, a spike in beef prices during the herd rebuilding phase will lend support to lamb and mutton prices as high income consumers substitute towards these products.

Forecast for Meat prices: Understanding the underlying trend

The individual forecasts for each of the components are combined to create a composite forecast for meat prices from 2016 to 2018. Thanks to a moderation in poultry and pork prices, meat prices are expected to average 5.6 per cent in 2016, down from 5.9 per cent recorded in 2015. Meat prices are expect to peak at 9.5 per cent in 2018Q1, but will remain elevated in the outer year of the forecast. This is predominantly due to the expected trend in beef prices, and subsequent price increases in other protein sources as consumers substitute towards relatively cheaper products. For this reason, meat prices are expected to average 6.5 per cent in 2017, increasing to 8.4 per cent in 2018.

[15] Feed costs represent 75 per cent of pork production costs.

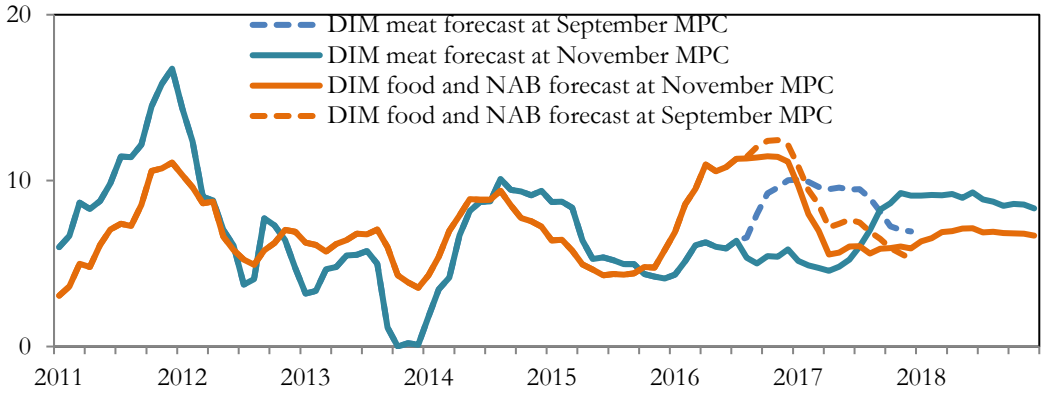
Figure 5. Composition of overall meat prices
Year-on-year percentage change



This represents a rather significant departure from the forecast produced in July 2016 (presented before the September MPC). The previous forecast expected the impact of the drought to become evident very early in the forecast period, and thus predicted momentum in meat prices in 2016. Lower-than-expected outcomes in the second half of the year called for a reconsideration of the underlying trends in meat prices.

For this reason, the forecast was updated to indicate the price pressures associated with the herd rebuilding phase in beef and the subsequent demand switch to pork and lamb. These three proteins constitute 41 per cent of total meat prices, and movements in these subcategories will likely dictate price dynamics for meat in total.

Figure 6. Revision of the outlook on meat and food (including NAB) prices
Per cent (year-on-year)



The revised meat forecast brings down the peak in total food & non-alcoholic beverages CPI by about 1.2 percentage points. At the November MPC, the trend peaked at 11.3 per cent in both the third and fourth quarters of 2016, down from the 12.3 per cent for the fourth quarter in the September MPC. Revised with October 2016 CPI data, the fourth quarter now peaks at 11.6 per cent, driven mainly by an uptick in the vegetables category. Overall, food inflation is expected to average above 6 per cent throughout the forecast period, with a relative low mid-2017 of just under 6 per cent as the rising trend in meat and declining trend in cereals intersect.