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## Israel

### Grain and Feed Annual

# Wheat Production Recovers, Demand for Imported Feed Ingredients Remains Strong

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**Report Highlights:** Israel is almost completely dependent on imports to meet its grain and feed needs. Total grain imports are expected to decline marginally in 2018/19 as Israeli wheat production rebounds and global corn prices edge higher. The decrease will be more than offset by growing imports of dried distillers grains with solubles (DDGS) and corn gluten feed (CGF), nearly entirely of U.S. origin. Total wheat imports are forecast to rebound in 2018/19 on higher food and feed use.

**Executive Summary:**

Israel is almost completely dependent on imports to meet its grain and feed needs. The maximum area that can be planted with wheat is about 100,000 ha, of which only 70,000 ha were harvested during the last season. Feed corn and soybeans are not grown in Israel, making the country entirely dependent on imports. Of the total grain and feed imports in MY 2017/18, 77 percent was used for livestock feed, 16 percent was used for flour milling, and 7 percent was for soybeans and corn for oil and starch production.

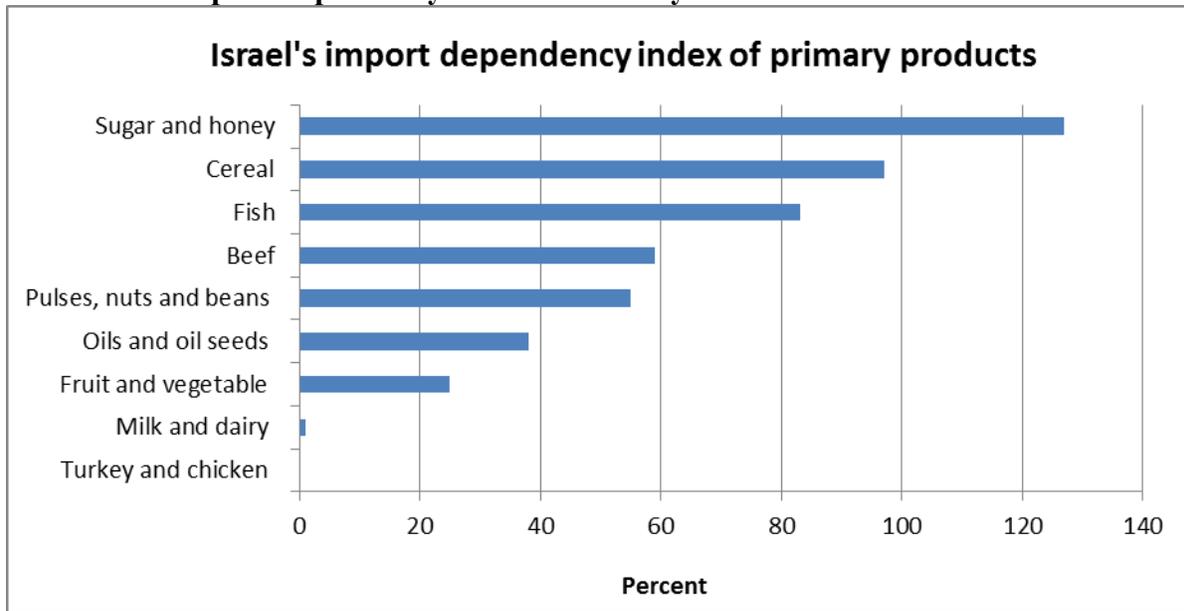
**General:**

While Israel is almost self-sufficient in milk, poultry, and certain fruits and vegetables, it remains highly dependent on imports of many grain and feed products. Israel imported 4.922 million metric tons (MMT) of grain and feed in MY 2017/18. Imports increased to 5.396 MMT in MY 2017/18. Figure 1 demonstrates Israel’s dependence on the import of primary products. When a value exceeds 100 percent, it should be understood that the export from Israel is based on imports that were processed. One hundred percent means full dependency on imports; 0 is full self-sufficiency, or no imports. As can be seen in Figure 1, Israel is over 90 percent dependent on imports to meet its grain and cereal needs.

The import dependency index is calculated by taking the absolute value of the following:

$$\text{import dependency index} = \frac{\text{import}}{\text{export} - (\text{import} + \text{production})} * 100$$

**Figure 1: Israel’s Import Dependency Index of Primary Products**



Source: CBS Israel

## **Wheat**

### **Production:**

In MY 2018/19, FAS Tel Aviv forecasts wheat production of 110 thousand metric tons (TMT), which is 120 percent higher than the 50 TMT of wheat production of MY2017/18. Wheat production in Israel is fully dependent on rainfall, and the sharp drop in MY2017/18 production was a direct result of the low precipitation and the short winter. The rainfall ended during January 2017 while the crops were in an early stage of development and in need of moisture. As a result of the adverse weather conditions and their negative impact on the crop, FAS Tel Aviv adjusted the MY2017/18 production figure downward to 50 thousand metric tons.

About 70 percent of Israeli wheat is planted in the southern part of the country and the rest in the central and northern regions. Average rainfall in the southern wheat producing regions generally reaches 450mm per year, while the northern regions receive 500-550mm per year. Annual rainfall is concentrated during the winter months, from October till April. During MY 2017/18 the rainfall ended on February 11, with February recording only ten percent of its normal rainfall. From February to May there were no significant rain events. The average rainfall during MY 2017/18 was only 55-65 percent of its normal average in the southern growing areas, and 70 percent of normal in the northern growing areas. The adverse weather conditions drastically impacted 2017/18 production levels.

Current precipitation and soil moisture distribution are within the annual averages, though the rainy season began late; around the end of January 2018. Post Tel Aviv expects the late arrival of rain to have some impact on total production due to later than normal germination. Post forecasts MY 2018/19 production levels to be 30 to 40 TMT lower than the average; however, still higher than MY 2017/18. Importantly, the southern crops will likely be the most impacted as the soil moisture will evaporate more quickly as temperatures rise; some fields may not reach maturity. While in any given year about 100,000 ha are planted in wheat, only about 70 percent are harvested for milling; the remainder is used as fodder for livestock feed. Post anticipates no change in this trend.

**Table 1: Israel's Wheat Production (TMT) and Annual Percent Change**

<b>MY</b>	<b>Total Production</b>	<b>Annual Percent Change</b>
2007/08	145	10
2008/09	60	-59
2009/10	100	67
2010/11	100	0
2011/12	100	0
2012/13	165	65
2013/14	130	-21
2014/15	90	-31
2015/16	155	72
2016/17	142	-8
2017/18	50	-65
2018/19	110 (forecast)	120

### **Consumption:**

Wheat consumption in MY 2018/19 is forecasted at 1.8 MMT, which is an increase of 99 TMT or six percent from MY 2017/18 figures. It seems that in MY 2017/18 some of the wheat imports to Israel for feed use shifted to other grains, mainly corn, due to the increase of wheat prices and the decrease in the price of other grains. For human consumption, there is growing preference amongst Israeli consumers to use substitutes to white flour. Increasingly, buyers are using rice, spelt, teff, and rye flours in lieu of white wheat flour.

*Feed Wheat* – The Israeli feed milling industry shifts easily from corn, barley and sorghum to feed wheat and vice versa, depending on prevailing prices. Feed mills do not entirely substitute one grain in their mix for another grain, regardless of the price relationship. For example, with wheat and corn, in spite of the increase in the price of feed wheat in 2017, feed mills still used significant quantities of wheat in their feed products and did not replace it completely with cheaper grains such as corn and barley. Most mills use a computerized system to assist with substitution decisions in rations. The systems produce a best-value product considering the costs and benefits of available inputs (protein, carbohydrates, fat, price, etc.). Israeli feed mills produce hundreds of different feed formulas for different usages and for the different growth stages of the animals; each formula has a slightly different feed ratio.

In MY 2017/18, Israel imported 778 TMT of feed wheat. Due to their proximity, exporters from the Black Sea region, primarily Russia and Ukraine, dominated shipments to Israel. Imports of feed wheat from the U.S. in MY 2017/18 were zero, as they have been since 2010. Feed wheat of U.S. origin was priced at least US \$30 per ton higher than Black Sea competitors.

*Milling Wheat* – Israeli wheat for milling is sourced from Russia, the United States, Hungary, Germany, Canada, and Romania. Most of these imports are hard red winter wheat. There are 19 flour mills in Israel, with a total capacity of 1.3 million tons. In addition to milling wheat, there are also imports of packaged flour mainly from Ukraine and Russia. Annual non-feed wheat consumption in Israel is steady at about 1,000,000 MT. Israel is also shipping some wheat flour to the Palestinian Authority (PA) due to their insufficient milling capacity and high demand.

### **Trade:**

In MY 2018/19, post forecasts total wheat imports at 1.7 MMT an increase of 49 TMT, or three percent from MY2017/18. The increase is expected to be primarily in feed wheat, which might substitute for some corn imports due to price pressure.

*Feed Wheat* – As forecasted in 2017, some feed wheat imports were displaced by corn imports due to corn's competitive pricing. In spite of price pressures, the substitution is expected to be nominal due to the advanced feed ration systems discussed above. Most feed wheat is imported from Ukraine.

*Milling Wheat* – In MY2018/19 milling wheat imports are expected to reach 890 TMT. In spite of annual population growth of two percent, consumption remains stable, due to consumption trends that have led to reduced use of white flour. Increasing numbers of people in Israel are looking for substitutes for white flour that are considered healthier. A recent trend in Israel is to decrease white bread consumption and to replace it with bread baked from alternative flours, such as rice, spelt, teff, and rye flours.

The local production of milling wheat covers a maximum of 15 percent of annual consumption. The market share of U.S. wheat is expected to further decrease in MY2018/19. Wheat exports from the U.S. tend to have lower stability values than those demanded by Israeli millers, making the use of U.S. product impracticable in many cases. In the current marketing year, the share of U.S. was 12 percent of total imports compared to 15 percent in MY 2017/18.

**Stocks:**

In MY 2018/19 wheat stocks are forecast at 331 TMT. Post is revising MY2017/18 stock estimates down to 326 TMT, from USDA's estimate of 355 TMT. The dismal performance of the MY 2017/18 wheat crop tightened supplies, which is reflected in the lower wheat for feed use and decreased ending stocks. Tight supplies incentivized the substitution of feed wheat for other feed grains, as can be seen in increased volumes of barley and corn going to feed.

The government's emergency stocks of milling wheat are usually at their annual high in July after the end of the harvest in Israel. During this period, stocks are generally at an estimated 150 TMT, which would be sufficient to cover two months of demand. Stocks generally decline from July through March or April to around 30 TMT, and rebound again at the onset of the harvest.

Emergency stocks are based on the domestic wheat harvest size; however, in the case of a shortage in local wheat production, stocks are rebuilt with imported wheat, as was done this year. Emergency stocks are controlled by the Israeli Ministry of Agriculture. The ministry also chooses, through tenders, the companies that are best suited to store the emergency stocks. In addition to the emergency stocks, local importers usually have some milling wheat stocks, which tend to be imported.

The Israeli Ministry of Agriculture also holds emergency stocks of feedstuffs. These include feed grains, oilseed meal, DDGS and CGF. Stocks of wheat normally stand at about 120 TMT and are sufficient to meet feed demand for approximately two weeks. Out of the total 120 TMT, about 20 TMT are feed wheat.

**Table 2: Wheat Production, Supply and Demand Data Statistics**

Wheat Market Begin Year	2016/2017		2017/2018		2018/2019	
	Jul 2016		Jul 2017		Jul 2018	
Israel	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Area Harvested	70	70	70	70	0	70
Beginning Stocks	336	336	355	331	0	326
Production	145	145	140	50	0	110
MY Imports	1758	1758	1700	1651	0	1700
TY Imports	1758	1758	1700	1651	0	1700
TY Imp. from U.S.	96	96	0	104	0	100
Total Supply	2239	2239	2195	2032	0	2136
MY Exports	9	9	5	5	0	5
TY Exports	9	9	5	5	0	5
Feed and Residual	850	850	800	778	0	800
FSI Consumption	1025	1025	1035	923	0	1000
Total Consumption	1875	1875	1835	1701	0	1800
Ending Stocks	355	355	355	326	0	331
Total Distribution	2239	2239	2195	2032	0	2136
Yield	2.0714	2.0714	2	0.7143	0	1.5714

(1000 HA) ,(1000 MT) ,(MT/HA)

## **Barley**

### **Production:**

In MY2018/19, barley production is expected to reach 15 TMT from a harvested area of 5,000 ha. Post Tel Aviv estimates that area planted in barley is 6,700 ha; however, 1,700 ha are being grown for silage. The remaining 5,000 ha are used for grain production. Most barley production is located in the south of Israel and the rest is in the Beit-Sh'e'an Valley, in eastern Israel. Production is about 3.0 MT per ha of grains and 8.5 MT per ha when cultivated for silage.

### **Consumption:**

In MY 2018/19 barley consumption is projected to be 365 TMT. Barley is the third biggest feed grain in Israel after corn and feed wheat. Annual consumption is expected to range between 250-500 TMT in the coming years. Most barley in Israel is purchased as feed for livestock, mainly sheep. Most feed mills exchange some their feed wheat with barley depending on the commodity price.

### **Trade:**

In MY 2017/18 imports are expected to be of 380 TMT, an increase of 55 TMT from MY2016/17 estimates of 325 TMT. The changes are mostly due to the price dynamics between the main feed grains (corn, feed wheat, barley and sorghum), and are driven by Israel's feed milling industry. Barley and other grains are necessary in feed rations, due to the presence of *xanthophyll 1*, a pigment in corn that turns the broiler meat yellow. Poultry producers and feed millers use higher amounts of barley, sorghum or feed wheat to mitigate for the strong yellow pigment in chicken meat. Israeli consumers tend to associate a yellow color in poultry to poor health and obesity. In recent years, annual barley imports have varied between 190 and 550 TMT and are projected to stay at these levels in the coming years.

Post Tel Aviv expects total supply of barley in MY2018/19 to be very similar to the previous years with no significant changes to the forecast. There have been no imports of barley from the U.S. in recent years, a situation also not expected to change in the near future. Most barley imported is from Ukraine, due to proximity and lower prices.

### Stocks:

In MY 2018/19 stocks are forecast at 35 TMT. Most of the stocks will be from the government's emergency feedstuff stocks; however, some limited stocks may be held at private feed mills.

**Table 3: Barley Production, Supply and Demand Data Statistics**

Barley Market Begin Year Israel	2016/2017		2017/2018		2018/2019	
	Oct 2016		Oct 2017		Oct 2018	
	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Area Harvested	0	0	0	5	0	5
Beginning Stocks	13	13	29	30	0	35
Production	0	0	0	15	0	15
MY Imports	376	376	350	380	0	350
TY Imports	376	376	350	380	0	350
TY Imp. from U.S.	0	0	0	0	0	0
Total Supply	389	389	379	425	0	400
MY Exports	0	0	0	0	0	0
TY Exports	0	0	0	0	0	0
Feed and Residual	350	350	350	380	0	355
FSI Consumption	10	10	10	10	0	10
Total Consumption	360	360	360	390	0	365
Ending Stocks	29	29	19	35	0	35
Total Distribution	389	389	379	425	0	400
Yield	0	0	0	3	0	3

(1000 HA) ,(1000 MT) ,(MT/HA)

### Corn

#### Production:

Although corn is grown in Israel, none is cultivated for feed use. In CY2017, total area planted in corn was 14,000 ha. Around half of the total was grown for silage, leaving 6,000 ha for human consumption as sweet corn, either fresh or processed, and 1,000 ha for popcorn. Israel is entirely dependent on imports of feed corn. Due to water constraints (dependency on irrigation, water shortages, and high prices), farmers will continue to produce other higher value crops in lieu of feed corn.

#### Consumption:

In MY 2018/19 corn consumption is forecast at 1.6 MMT a decrease of 115 TMT from MY2017/18. Consumption is expected to decrease as corn prices increase in the coming year. The MY2017/18 estimates were adjusted upwards by 375 TMT, based on lower prices. The 2017 price decreased four percent over 2016 prices, in addition to a strengthening of the Israeli Shekel against the U.S. dollar.

Corn is the main commodity used by Israel's feed industry. Consumption is driven by poultry and egg production, followed by dairy, turkey and other ruminants. In the last decade, total animal protein production increased by 7.8 percent, reaching 676 TMT in 2016. This trend is expected to continue in the coming years. Annual per capita meat consumption in Israel is 86.1 kg per person, ranking it fourth in the world after Australia with 90.3 kg, United States 90.1 kg, and Argentina with 86.6 kg per capita (2014 statistics).

*Broilers* – In 2016, the poultry production quota system was eliminated. With no mandated quota, production surpluses, too high to be absorbed by the local market, were expected, though none have been seen thus far. Growers are attempting to put in place an internal quota control to avoid excess production. The quota system, which began in 1997, increased broiler production by 113 percent as of 2014. Poultry production in 2016 totaled 538 TMT. As for now the Israeli market is self-sufficient in chicken, and supplies all of its needs domestically.

*Table Eggs* – In MY 2016, table egg production was two billion, with almost no change from the previous year. There are shortages in the Israeli market that usually occur around the months of April and September, due to local holidays. The shortages are generally filled with imported table eggs. In 2017 the shortage in the market increase due to the closing of some of export markets by the Israeli Veterinary Services due to SPS issues. Israeli table egg production is controlled by the Israeli Mistry of Agriculture using a production quota system. There is little incentive or interest in changing the existing system. During 2017 there was an outbreak of Salmonella in a few Israeli chicken farms, which were later banned from suppling eggs to the domestic market, exacerbating the seasonal shortage.

*Milk* – In 2016, local milk production increased to 1,530 million liters, with almost no change from the previous year. Milk production is also regulated by the Ministry of Agriculture using a production quota system. Post estimates that total milk production will continue to slowly grow. Local consumption per capita is about 180 liters per person, which is relatively low compared to western countries' consumption of 220 liters per person.

*Beef* – In recent years, local production of beef increased significantly. Local beef production in 2016 totaled 99 TMT. Given the limited grazing area in Israel, the country becomes ever more dependent on imported feeder cattle and chilled or frozen beef as demand increases. With the resource constraints and high dependence on imported inputs, locally produced beef is now noticeably more expensive than imported product. Israel imports frozen beef from South American suppliers and recently started importing chilled and frozen beef from the United States. In 2016 beef imports totaled 79.5 TMT.

In 2017, Israel imported 204,145 feeder cattle, which was 32,740 less than in 2016. Public protests in favor of increased animal welfare are putting pressure on the Ministry of Agriculture to reduce shipments of live animals, replacing the shipments with imported chilled beef. In 2017 Portugal was the largest single supplier of feeder cattle, with 31 percent of the total. Australia, once the largest supplier of feeder cattle to Israel, now covers only 14 percent of total supply.

Post Tel Aviv expects to see an increase in both chilled and frozen beef imports, with a concomitant decrease in imported feeder cattle. In 2016 the total supply of beef in Israel was 137.8 TMT, out of which 50.5 TMT were from local slaughter and 87.3 were from imports of chilled and frozen beef. The demand for beef in Israel is expected to continue to increase.

*Turkey* – Turkey is not common in Israeli cuisine. Most turkey produced is consumed by the local processing industry. The total production of turkey in 2017 was 85 TMT, 5 TMT less than in 2016. Consumption is expected to decrease due to negative publicity regarding the health impacts of processed meat products.

*Mutton and goat meat* – Israeli production of mutton and goat has been stable over the past few years, totaling around 18 TMT in 2015. The limiting factor for this product is the high price charged for fresh chilled meat. In 2017 Israel imported 258,309 sheep mainly from Portugal, almost 49,000 less than in 2016. The local demand for this product is expected to be stable in the coming few years.

*Pork* – Due to religious restrictions on pork consumption by the Jewish and Muslim population, local pork production is relatively small and production levels have remained unchanged since 1997, totaling about 16 TMT. Due to unchanged production levels and marginal increases in domestic demand for pork, prices have increased by about 113 percent since 1997. According to the Israeli Kosher Law, imports of non-kosher meats are not permitted. However, domestic pork production is permitted. As such, demand must be met with local production.

**Table 4: Livestock in Israel (number of head, ex fish)**

		2016	2010	2000	1990
Cattle	Total Cattle	507,000	421,000	364,000	332,000
	Milk Cows	115,000	120,000	125,000	109,000
Poultry	Layers	9,571,000	9,005,000	7,071,000	6,800,000
	Broilers	32,752,000	33,594,000	20,462,000	14,300,000
	Turkeys	3,510,000	3,800,000	4,785,000	2,830,000
Sheep		489,000	445,000	380,000	375,000
Goat		118,000	100,000	62,000	115,000
Pig		19,000	23,000	13,000	N/A
Fish	Fresh Water	24,000 MT (estimate)	N/A	N/A	N/A

\*Data are end of year totals

Source: Israeli Central Bureau of Statistics

### Feed Industry

About 90 percent of the local feed milling industry is controlled by eight feed millers. The biggest feed milling company is Ambar, with a market share of around 22 percent. The firm has plans to increase production by about 12 percent in the coming years. There are approximately 150 feed centers in Israel. These are communal feed mills operated by local farming communities or *Kibutzim*, which sell their feed mix chiefly to the cattle industry. Out of the total feed centers, 15 are large feed centers, servicing the largest cattle producers, while the remaining 135 are smaller operations, selling feed to smaller producers. Each small feed center supplies feed to 100-300 cattle. In Israel, due to the dry weather including long dry summers and short winters with little rainfall, beef cattle lack grazing meadows. Most of the year farmers have to feed cattle, making beef production in Israel relatively expensive.

The total market of the Israeli feed milling industry (feed millers and feed centers) is estimated at about four million tons of feed per year, excluding hay and silage. Their typical mix is made of grains, oilseed meals (soy, sunflower, and canola), and other feed sources such as DDGS and CGF. Part of the feed prepared by the Israeli feed mills is shipped to Jordan and to the Palestinian Authority. It is estimated that about 15 percent is being re-exported.

Israel's feed sector is expected to be stable or grow only marginally as consumers buy more imported beef in lieu of domestically-produced product. After abnormally low wheat yields in MY 2017/18 drove feed millers to substitute wheat for corn and barley, post expects a normalization of consumption

patterns in the coming year. Israeli feed producers are expected to use more wheat in MY 2018/19, with concomitant decreases in corn and barley. Notably, DDGS and sorghum are also expected to remain attractive low-cost inputs in feed rations in the future.

**Table 5: Feed Prices in Israel (US\$/MT)**

	<b>August 2016</b>	<b>August 2017</b>	<b>% Difference</b>
<b>Corn</b>	<b>200</b>	<b>192</b>	-4
<b>Barley</b>	<b>175</b>	<b>190</b>	+8.5
<b>Feed wheat</b>	<b>180</b>	<b>195</b>	+8
<b>Soy meal</b>	<b>500</b>	<b>450</b>	-10
<b>Gluten feed</b>	<b>225</b>	<b>210</b>	-7
<b>Canola meal</b>	<b>280</b>	<b>245</b>	-12.5
<b>Sunflower meal</b>	<b>300</b>	<b>220</b>	-26.6
<b>DDG</b>	<b>270</b>	<b>235</b>	-13
<b>Exchange rate INS/\$</b>	<b>3.795</b>	<b>3.601</b>	-5.1

Source: Israeli Cattle Growers Association

**Trade:**

In MY 2018/19 corn imports are forecast to be 1.6 MMT, of which 350 TMT are expected to be of U.S. origin. In recent years, corn has been imported mainly from Ukraine, Argentina and Brazil. In MY 2017/18, 112 TMT of U.S. corn is expected to be exported to Israel, 315 TMT less than the previous period. The dramatic decline of U.S. corn exports to Israel in the past decade is due to competitive pricing of Ukraine and South American corn, cheaper shipping costs, and quality concerns with U.S. corn. Notably, in the Middle East and North Africa, U.S. corn is increasingly perceived as being of lower quality than South American or Black Sea product. According to local industry contacts, corn shipments from the U.S. typically arrive with a higher percentage of broken kernels than comparable shipments from other sources.

Ukrainian and other Black Sea corn source’s proximity to Israel, results in a freight advantage over the United States and South America. Israeli importers report that Ukrainian corn, including freight, may be as much as \$30 per ton less than U.S. product. Corn imports over the past ten years have ranged between 900 – 1,700 TMT and are expected to be at similar levels in the coming years.

Israel remains a steady, long-time customer of U.S. corn co-products including DDGS and CGF. In recent years DDGS and CGF imports have increased significantly. In MY 2017/18, Israel imported 473 TMT of CGF and DDGS, of which 99.5 percent was from the United States. This figure has doubled in the last decade. The country's dairy sector is a heavy user of DDGS and CGF with some DDGS earmarked for poultry consumption.

**Stocks:**

MY 2018/19 ending stocks are forecast at 71 TMT. These stocks will be held in government storage, as well as privately-owned feed mills and centers.

**Table 6: Corn Production, Supply and Demand Data Statistics**

<b>Corn</b>	<b>2016/2017</b>		<b>2017/2018</b>		<b>2018/2019</b>	
<b>Market Begin Year</b>	<b>Oct 2016</b>		<b>Oct 2017</b>		<b>Oct 2018</b>	
<b>Israel</b>	<b>USDA Official</b>	<b>New Post</b>	<b>USDA Official</b>	<b>New Post</b>	<b>USDA Official</b>	<b>New Post</b>

<b>Area Harvested</b>	0	0	0	0	0	0
<b>Beginning Stocks</b>	34	34	69	51	0	81
<b>Production</b>	0	0	0	0	0	0
<b>MY Imports</b>	1515	1515	1400	1755	0	1600
<b>TY Imports</b>	1515	1515	1400	1755	0	1600
<b>TY Imp. from U.S.</b>	84	84	0	112	0	350
<b>Total Supply</b>	1549	1549	1469	1806	0	1681
<b>MY Exports</b>	10	10	10	10	0	10
<b>TY Exports</b>	10	10	10	10	0	10
<b>Feed and Residual</b>	1370	1370	1270	1615	0	1500
<b>FSI Consumption</b>	100	100	100	100	0	100
<b>Total Consumption</b>	1470	1470	1370	1715	0	1600
<b>Ending Stocks</b>	69	69	89	81	0	71
<b>Total Distribution</b>	1549	1549	1469	1806	0	1681
<b>Yield</b>	0	0	0	0	0	0
(1000 HA) ,(1000 MT) ,(MT/HA)						