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**Date:** 12/21/2017

**GAIN Report Number:** KS1748

## **Korea - Republic of**

**Post:** Seoul

### **The Use of DDGS In The Korean Market: Onwards and Upwards**

**Report Categories:**

Grain and Feed

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**Report Highlights:**

Distiller's dried grains with solubles (DDGS) are a byproduct of corn ethanol production. This derivative is primarily used in compound animal feeds as a vegetable based protein. Because of its high protein and favorable price spread against its substitutes, soybean meal and corn gluten feed, it has been adopted by 96% of Korean feed millers. Korean imports have increased from 656,307 MT in Marketing Year (MY) 2014/15 (Oct./Sep.) to 894,982 MT in MY 2015/16 (Oct./Sep.). The United States has held an 89% or higher market share since MY 2008/09 (Oct./Sep.). The DDGS inclusion rate increased from 3.4% in MY 2014/15 to 4% in MY 2015/16. It is expected that this rate will continue to increase due to DDGS' favorable price spread. The U.S. Grains Council/Seoul set a target of 7.5% inclusion rate and 1.5 million MT of imports per annum in Korea by 2025.

DDGS exporters must follow Korean government and private buyers' guidelines and regulations. These rules are designed to protect Korean importers from quality and toxicity issues. Sellers looking to expand into the Korean market should refer to import regulations and consult the U.S. Grains Council/Seoul (<http://www.grains.org/worldwide-offices/korea> ).

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**SECTION I: MARKET OVERVIEW**

The Republic of Korea's (henceforth referred to Korea) DDGS imports totaled USD 185.8 million in MY 2015/16 (Oct./Sep.), up 15.8% from the USD160.5 million in MY 2014/15. In terms of volume, MY 2015/16 imports totaled 849,401 MT, up 29.4% from the 656,307 MT imported in MY 2014/15.

Total DDGS imports went from 371,517 MT in the first half of CY 2016 to 476,889 in the first half of CY 2017, an increase of 26.6%. U.S. DDGS exports increased 28.4% in the same period. The average price of U.S. DDGS fell from USD 215.63/MT in the first half of CY 2016 to USD 187.91/MT in the first half of CY 2017.

The DDGS inclusion rate (the percentage of total compound feed composed of DDGS) increased from 2.8% in MY 2013/14 to 3.4% in MY 2014/15 before reaching 4% in MY 2015/16. Feed millers have generally accepted DDGS as a viable substitute for soybean meal and corn gluten feed because of its nutrition content and favorable price spread. An estimated 96% of Korean feed millers use DDGS in their compound feeds. Imports were forecast to reach a record one million MT in MY 2016/17.

The United States had a 96% market share in CY 2016. U.S. DDGS have maintained at least 89% of the market share since CY 2009. China is the second largest DDGS exporter to Korea. Chinese exports have been decreasing due to quality issues and high domestic demand.

The adoption of U.S. DDGS is due in large part to the outreach and technical support campaign led by the U.S. Grains Council (USGC). In CY 2004, USGC began a Foreign Agricultural Service-supported multi-stage program in order to expand Korean DDGS usage in compound feed. The first stage sent technical consultants to feed millers to provide consultation on how to integrate DDGS into their compound feeds. Second, they organized outreach events that provided technical support and sales meeting programs for local traders. Third, USGC provided further technical support for any animal health or meat quality issues that arose in conjunction with the change in feed, including bringing in experts from the United States to talk directly with feed millers. These efforts have been instrumental in the integration of DDGS in feeds. The U.S. Grains Council's goal is to increase inclusion rates from the 4% rate in MY 2015/16 to 7.5% by CY 2025. With annual animal feed production expected to remain steady at between 19 and 20 million MT per annum through 2025, this would bring total DDGS imports to 1.5 million MT by CY 2025.

Though inclusion rates across all feed sectors averaged 4% in MY 2015/16, different industries apply different inclusion rates. For example, the poultry layer industry's DDGS inclusion rates are between 10% and 15%, while the broiler industry uses between 2% and 4%. Cattle feed's DDGS inclusion rate is generally between 4% and 8% while swine's inclusion rate is between 5% and 8%. Nutrition requirements, cost, and DDGS' effect on the final product's look and taste are all taken into consideration by feed millers. In recent years, there have been efforts to include DDGS in pet food.

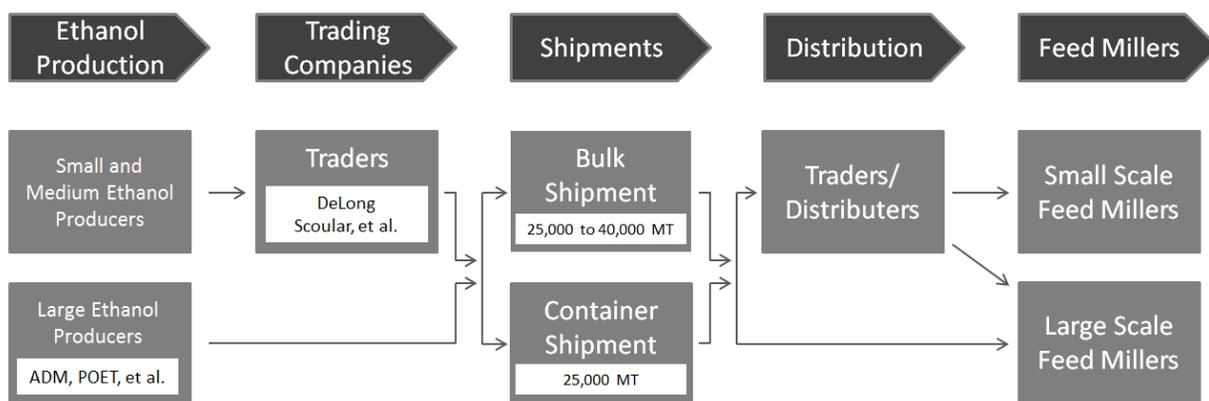
## SECTION II: MARKET SUPPLY

### A) Imported DDGS

Table 1

Korea: DDGS Import by Origin (MMR)						
Calendar Year	USA			China & Others (MT)	Total(MT)	US Market Share, %
	Volume (MT)	Value (USD/MT 1,000)	Price Average (USD/MT, CIF)			
2000	37	17	459.46	3,788	3,825	1%
2001	1,020	178	174.51	2,314	3,334	31%
2002	20	7	350.00	9,803	9,823	0%
2003	80	28	350.00	8,128	8,208	1%
2004	4,491	834	185.70	26,980	31,471	14%
2005	18,224	3,445	189.04	20,508	38,732	47%
2006	40,918	6,955	169.97	23,698	64,616	63%
2007	137,899	25,123	182.18	63,704	201,603	68%
2008	311,742	85,958	275.73	167,021	478,763	65%
2009	348,840	78,192	224.15	38,645	387,485	90%
2010	503,347	126,810	251.93	34,330	537,677	94%
2011	453,025	131,369	289.98	57,168	510,193	89%
2012	468,586	150,143	320.42	36,308	504,894	93%
2013	405,421	144,487	356.39	50,101	455,522	89%
2014	653,394	196,069	300.08	52,310	705,704	93%
2015	667,548	160,250	240.06	27,429	694,977	96%
2016	862,498	184,708	214.15	32,484	894,982	96%
2017 (Jan-Jun)	476,889	89,613	187.91	12,309	489,198	97%
2016 (Jan - Jun)	371,517	80,111	215.63	15,013	386,530	96%
2017 (Jan - Jun)	476,889	89,613	187.91	12,309	489,198	97%

### B) Supply Chain



U.S. DDGS imports are sourced from around 200 ethanol production plants, 80% of which are located in the Corn Belt. Larger companies that own multiple production plants, such as ADM and POET, produce enough DDGS to directly ship their product. Smaller production companies sell to traders like DeLong and Scoular. Container shipments can carry up to 25,000 MT while vessels carrying bulk shipments can load up to 40,000 MT (handy size). Around 20% of DDGS imports arrive on bulk vessels, while 80% are container shipments.

Korea has 69 compound feed millers who have used DDGS as an ingredient for compound feed production. Five large scale millers consume enough DDGS to import their feed directly from exporters. However, small millers import through local traders and distributors who keep stocks in warehouses because they do not use enough DDGS to warrant purchasing multiple shipping containers.

### SECTION III: MARKET DEMAND

Compound feed demand is expected to stay between 19 and 20 million MT per annum through CY 2025. DDGS inclusion rates have risen from 2.8% in MY 2013/14, to 3.4% in MY 2014/15, before reaching 4.0% in MY 2015/16. The U.S. Grains Council estimated DDGS imports at one million MT in MY 2016/17. If DDGS retains a favorable price spread against soybean meal and corn gluten feed, compound feed inclusion rates should continue to increase. Small changes in animal production may play a role. Exporters looking to expand into the Korean market should review the DDGS inspection standards. In order to protect against toxicity problems, Korean DDGS regulations are more stringent compared to other Asian countries.

Table 2

Korea: Feed Ingredients For Animal Usage (October/September Basis)						
Items	MY 2013/2014		MY 2014/2015		MY 2015/2016	
	1,000 MT	Percent	1,000 MT	Percent	1,000 MT	Percent
<b>Total Grains and Grain Substitution</b>	<b>12,080</b>	<b>64.2</b>	<b>12,046</b>	<b>63.4</b>	<b>12,395</b>	<b>63.8</b>
Corn	7,762	41.2	8,035	42.3	7,841	40.4
Wheat	1,633	8.7	1,480	7.8	1,910	9.8
Others 1/	2,685	14.3	2,531	13.3	2,644	13.6
<b>Total Vegetable Protein</b>	<b>4,674</b>	<b>24.8</b>	<b>4,867</b>	<b>25.6</b>	<b>4,937</b>	<b>25.4</b>
Soybean Meal 2/	2,079	11.0	2,272	12.0	2,531	13.0
DDGS	536	2.8	654	3.4	779	4.0
Palm Kernel Meal	760	4.0	686	3.6	721	3.7
Copra Meal	399	2.1	403	2.1	317	1.6
Rapeseed Meal	530	2.8	489	2.6	200	1.0

Corn Gluten Meal	81	0.4	82	0.4	71	0.4
Sesame Meal	23	0.1	33	0.2	37	0.2
Perilla Seed Meal	3	0.0	1	0.0	3	0.0
Cottonseed Meal	1	0.0	1	0.0	0	0.0
Others	262	1.4	246	1.3	274	1.4
<b>Total Animal Protein</b>	<b>186</b>	<b>1.0</b>	<b>189</b>	<b>1.0</b>	<b>205</b>	<b>1.1</b>
Meat & Bone Meal	22	0.1	24	0.1	30	0.2
Fish meal	18	0.1	18	0.1	15	0.1
Others	146	0.8	147	0.8	160	0.8
<b>Total Others</b>	<b>1,898</b>	<b>10.1</b>	<b>1,895</b>	<b>10.0</b>	<b>1,886</b>	<b>9.7</b>
<b>Total Compound Feed</b>	<b>18,838</b>	<b>100.0</b>	<b>18,997</b>	<b>100.0</b>	<b>19,423</b>	<b>100.0</b>

Source: Korea Feed Association

1/ barely, oat, broken grains, tapioca, lupin seed ,and grain substitutes such as brans and gluten feed

2/ includes dehulled locally processed soybean meal

Table 3

<b>Korea: Price Comparison of Major Imported Protein Meals</b> (USD/MT, CIF, Arrival Basis on annual average)						
	MY 2010	MY 2011	MY 2012	MY 2013	MY 2014	MY 2015
Fish Meal	1,682.29	1,558.53	1,776.74	1,654.13	2,004.71	1,724.64
Bone Meal	2,559.24	1,530.36	1,567.31	1,305.88	1,082.44	1,621.95
Cottonseed Meal	368.09	330.39	424.89	479.07	462.22	510.46
Soybean Meal	405.09	426.32	543.00	549.23	480.71	383.68
Sunflower Seed Meal	199.83	408.85	416.46	424.81	404.75	320.26
Rapeseed Meal	265.61	232.98	337.98	276.47	275.11	300.22
DDGS	269.66	305.61	348.62	320.18	244.49	218.78
Copra Meal	212.72	227.14	224.27	261.21	196.07	184.33
Corn Germ Meal	228.39	266.46	302.48	306.84	250.42	178.65
Palm Kernel Meal	169.83	147.74	182.12	189.55	127.73	105.99
Others	146.25	144.04	134.01	127.40	133.82	115.16

Source: Korean Customs Service (KCS)

Table 4

<b>Korea: Imports of Major Protein Meals</b> (October/September)						
	MY 2013/014		MY 2014/015		MY 2015/016	
	Volume (MT)	Value (1,000USD)	Volume (MT)	Value (1,000USD)	Volume (MT)	Value (1,000USD)
Soybean Meal	1,809,231	993,679	1,735,694	834,364	2,104,092	807,293
DDGS	610,372	195,429	656,307	160,458	849,401	185,831
Palm Kernel Meal	839,145	159,060	727,855	92,968	724,064	76,744
Copra Meal	410,146	107,136	415,632	81,495	289,902	53,437
Rapeseed Meal	555,307	153,524	499,300	137,364	223,484	67,095
Fish Meal	49,440	81,780	47,933	96,092	49,910	86,077
Corn Germ Meal	20,170	6,189	6,022	1,508	27,507	4,914
Cottonseed Meal	18,296	8,765	12,851	5,940	10,281	5,248
Sunflower Seed Meal	1,177	500	1,559	631	3,747	1,200
Bone Meal	255	333	279	302	246	399
Others	516,931	65,856	391,038	52,327	465,317	53,698
<b>Total</b>	<b>4,220,098</b>	<b>1,576,822</b>	<b>3,838,298</b>	<b>1,303,061</b>	<b>3,898,550</b>	<b>1,156,105</b>

Source: Korean Customs Service (KCS)

Table 5

<b>Korea: DDGS Consumption by Industry</b>		
Industry	Current DDGS Inclusion Rate	Notes
Layer	10-15%	The layer industry is the largest consumer of DDGS. Korean consumers associate yellow pigmentation in poultry with health. DDGS's color makes the yolk a darker yellow, making it more attractive to consumers.
Swine	5-8%	The swine industry is second in DDGS consumption. Domestic swine production is increasing market share over beef. Its profit margins are higher for producers and consumers are more willing to substitute pork for beef.
Cattle	4-8%	Domestic beef production is declining. Consumers are substituting the native Hanwoo beef for cheaper imports.
Broiler	2-4%	DDGS is limited in broiler production because the cereal's high protein content can lead to health issues for broiler chickens, including watery stool.
Aquaculture	Nominal	While common in Southeast Asia, very limited amounts of DDGS are used as aquaculture feed in Korea. This is due to a combination of aquaculture feeding and water pollution regulations.
Pet food	Nominal	There are efforts to include DDGS in pet food.

Source: U.S. Grains Council interview

## SECTION IV: MARKET ACCESS

### A) IMPORT TARIFF AND TAXES

The CY 2017 WTO TRQ for DDGS is set at unlimited volume with zero percent duty. Accordingly, there is a zero percent in-quota import duty for countries under FTAs. As part of the KORUS FTA, Korea eliminated import duties on DDGS (H.S. Code 2303.30.0000) and other vegetable protein meals from the United States on March 15, 2012.

### B) INSPECTION & SAFETY STANDARDS

DDGS imports must adhere to Korean government regulations and buyer specifications.

Table 6

<b>Korea: Government Control Target Toxin</b>	
Toxin	Action Level (mixed feed)
Aflatoxin	10 Parts per billion (PPB)
Ochratoxin	200 PPB

Source: Control of Livestock and Fish Feed Act, USGS

Table 7

<b>Korea: Government Recommendation to Control Toxin</b>	
Toxin	Advisory Level (mixed feed)
Deoxynivalenol (Vomitoxin)	Swine – 900 Parts per billion (PPB)
	Ruminants – 2,000 ppb
Zearalenone	Swine – 100 ppb
Fumonisin	5,000 ppb
T-2/HT-2	250 ppb

Table 8

<b>Korea: DDGS Buyers' Specification</b>	
Type	Grade
Profat	35.0% Min
Crude Fat	7.0% Min
Crude Fibre	10.0% Max
Crude Ash	7.0% Max
Moisture	12.0% Max
Color	GOLDEN (HUNTER SCALE 50 Min)
Vomitoxin	5 ppm Max
Aflatoxin	20 ppb Max

Source: USGC/Seoul

### **Export Requirements:**

See APHIS' website ([http://www.aphis.usda.gov/import\\_export/plants/plant\\_exports/index.shtml](http://www.aphis.usda.gov/import_export/plants/plant_exports/index.shtml)) regarding phytosanitary requirements for shipping DDGS to Korea.

For more information, please contact Agricultural Affairs Office of the U.S. Embassy in Seoul, Korea.

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