

Political unrest was a major theme in many countries around the world in 2016. In June, the United Kingdom voted to leave the European Union, giving way to the new term “Brexit.” In July, there was a failed coup in Turkey and presidents in Brazil and South Korea were impeached. Come November, real estate mogul and billionaire Donald Trump was elected president of the United States (US) in what some consider a strong nationalist movement. The International Monetary Fund is projecting the world’s economic growth rate declined slightly in 2016 to 3.1 percent from 3.2 percent in 2015. World growth is forecasted at 3.4 percent in 2017 driven by developing nations while the growth rate in developed countries is expected to remain low.

High pathogenic avian influenza was reported in Dubois County, Indiana, in January 2016 and although most US trading partners now accept that heat-treated rendered products are safe, a ban on exports of rendered poultry products followed.

live weight increased to 1,363 pounds, up 3 pounds, a trend that is continuing. In the last 15 years, cattle slaughter weights have risen 9 percent. Swine and poultry slaughter continues to surge as well. Despite swine slaughter declining 5 percent in 2014 due to the mortalities caused by porcine epidemic diarrhea virus, the industry rebounded in 2015, and in 2016 swine slaughter grew more than 2 percent to just over 118 million head, an 11 percent bump from 2014. Live weight decreased slightly from 283 pounds in 2015 to 282 pounds in 2016.

Broiler production grew 1 percent in 2016 totaling over 8.9 billion birds slaughtered while live weight was up 1 percent from 2015 from 6.12 pounds per bird to 6.16 pounds per bird signaling an upward trend of heavier birds for slaughter. In the last 15 years, slaughter weights for broilers have gone up 12 percent. This increased livestock and poultry production led to 400,000 metric tons more of rendered fats and proteins being produced in 2016 over 2015, a 4.2 percent growth.



Market Report

Ups and downs all around

By Kent Swisher
Vice President, International Programs, National Renderers Association

In addition, an “all-vegetarian diet” trend in the US poultry industry continues to lower demand for rendered products. According to Informa Economics, over 20 percent of broilers and 25 percent of layers are now fed all-vegetarian diets. Informa estimates this trend will expand to 30 to 35 percent and 50 percent, respectively, in the next five years further establishing the importance of access to global markets for rendered products.

Partly due to this vegetarian trend in poultry diets, prices for processed animal protein meals declined an average of 17 percent in 2016 while exports grew 28 percent. One highlight last year was that the first exports of tallow to China since 2003 arrived and were well received. This concluded over 10 years of market access negotiations for tallow between the United States and China, with support from the National Renderers Association (NRA). Exports are expected to increase as more US companies get approved to ship tallow to China.

Domestic Developments

Supply

Cattle slaughter in 2016 was 30.5 million head, up 6 percent over 2015, the first year of growth since 2010. In addition,

Production and consumption data for the rendering industry was traditionally reported in the US Census Bureau’s *M311K – Fats and Oils: Production, Consumption, and Stocks* report, but this report was discontinued in July 2011 after government cutbacks. In subsequent industry market reports, the data in table 2 was derived by NRA using historic relationships between livestock production as reported by the National Agricultural Statistics Service (NASS) and rendered product production. However, in May 2015, NASS began surveying rendered product production with 2016 being the first full year of data NASS has released. Hence, 2016 production in table 2 is derived from the NASS *Fats and Oils: Oilseed Crushings, Production, Consumption, and Stocks Annual Summary* report that was released in March.

Using the 21 months of NASS data compiled as a baseline to derive historic production, some of the 2011-2015 data in table 2 has been revised, leading to higher tallow, poultry fat, and protein meal production figures than previously reported. For 2016, NASS also included two new products in its report – technical tallow and other fat. Yellow grease production in table 2 for 2016 is NASS data, but prior years are calculated using the relationship between yellow grease production numbers in the

2010 Informa Economics report, *A Profile of the North American Rendering Industry*, and cooking oil consumption as reported by the US Department of Agriculture (USDA). However, since the NASS publication does not include consumption, the data in table 2 for rendered fats use in biodiesel/renewable fuel is compiled from the Energy Information Agency (EIA) *Monthly Biodiesel Production Report*. Other consumption data is derived by subtracting production estimates from export estimates and biodiesel/renewable fuel usage.

Following the trend in increased slaughter and slaughter weights, rendered product production grew in 2016. Total tallow production was up 6.6 percent to more than 2.5 million metric tons. This includes about 1.6 million metric tons of inedible tallow, up 6.3 percent from 2015; 563,000 metric tons of technical tallow, up 9 percent; and 410,000 metric tons of edible tallow, up 6 percent from 2015. White grease production followed the rise in pork slaughter and was up 1.4

Demand

The rendering industry produces commodities for the livestock feed, pet food, energy, and oleochemical industries along with edible products for food. The largest demand sector comes from livestock feed and pet food. According to the 2017 Alltech Global Feed Survey, the United States produced 169.7 million metric tons of feed in 2016, down 2 percent from 173.7 million metric tons in 2015. The largest market for rendered fats continues to be the feed sector followed by the oleochemical and biofuel industries. Reliable data for fat use in oleochemicals is not available; however, in the biodiesel and renewable fuel industry, EIA reports about 1.1 million metric tons of rendered fat was used for biofuel in 2016, down slightly from 2015. This demand is somewhat a function of price but also of the Environmental Protection Agency's Renewable Fuel Standard and other state regulations, including the Low Carbon Fuel Standard Program in California.

Table 1. Average annual prices of select rendered products, 2011-2016 (per metric ton)

Product (Location)	2011	2012	2013	2014	2015	2016	% Change 15/16
Fats							
Beef tallow, packer (Chicago)	\$1,095	\$963	\$887	\$801	\$581	\$638	10
Choice white grease (Missouri River)	\$1,020	\$926	\$846	\$711	\$498	\$537	8
Edible tallow (Chicago)	\$1,176	\$1,068	\$946	\$865	\$638	\$714	12
Edible tallow (Gulf)	\$1,180	\$1,034	\$966	\$803	\$563	\$746	32
Lard (Chicago)	\$1,093	\$1,279	\$1,081	\$959	\$670	\$708	6
Poultry fat (Mid-south)	\$992	\$864	\$793	\$660	\$502	\$546	9
Yellow grease (Missouri River)	\$932	\$788	\$727	\$612	\$462	\$505	9
Protein meals							
Blood meal, porcine (Midwest)	\$1,047	\$1,214	\$1,308	\$1,643	\$1,086	\$899	-17
Blood meal, ruminant (Missouri River)	\$949	\$1,122	\$1,232	\$1,580	\$1,070	\$857	-2
Feather meal (Mid-south)	\$565	\$715	\$701	\$772	\$521	\$391	-25
Meat and bone meal, porcine (Missouri River)	\$462	\$552	\$527	\$556	\$377	\$314	-17
Meat and bone meal, ruminant (Missouri River)	\$413	\$473	\$464	\$502	\$359	\$294	-18
Poultry by-product meal (57% protein, Mid-south)	\$524	\$594	\$582	\$610	\$447	\$330	-26
Poultry by-product meal (67% protein, Mid-south)	\$795	\$919	\$821	\$871	\$602	\$614	2

Source: The Jacobsen.

percent to 788,000 metric tons in 2016. Lard rose 3.7 percent to 167,000 metric tons while choice white grease production was 620,000 metric tons, up nearly 1 percent over 2015.

Yellow grease/used cooking oil (UCO) production was approximately 916,000 metric tons last year. The production of yellow grease and UCO are lumped together in the NASS report so there is no reliable figure for UCO production as a stand-alone product. Other grease production was 336,000 metric tons in 2016, which includes fats and blends of fats that do not fall under the definition of previously reported categories. In total, fat production in 2016 was 5.7 million metric tons, up 208,000 metric tons, or 3.8 percent, from 2015.

It must be noted the cattle cycle finally reversed itself in 2016 and production will continue to grow into the foreseeable future. Meat and bone meal production – which includes ruminant, porcine, and mixed species – was 2.7 million metric tons in 2016, up 5 percent from 2015. Poultry meal production was around 1.4 million metric tons last year, a 3.3 percent increase from the previous year, while feather meal production was 527,000 metric tons, up 2.8 percent. Total processed animal protein production in 2016 grew 4.2 percent to 4.6 million metric tons, 180,000 metric tons more than in 2015.

Overall domestic demand for rendered products in 2016 was roughly 8.7 million metric tons, up 2.5 percent from 2015. Exports of rendered products were 1.6 million metric tons, up 13 percent. Domestic consumption of fat was about 5.0 million metric tons last year, up 4 percent from the previous year. Consumption of fat in the food, feed, fatty acid, carryover, and other category was just over 3.8 million metric tons, a 6.3 percent increase from 2015. Tallow consumption in this category was 2.0 million metric tons, up 12 percent, while yellow grease and “other grease” consumption was 336,000 metric tons, down more than 10 percent from 2015. Total fat consumption in this segment accounted for 67 percent of total rendered fat production.

Consumption of rendered fats in the biofuel segment was 1.1 million metric tons in 2016, down 3.7 percent from 2015. Biofuel production accounted for 20 percent of the rendered fats produced last year. Consumption of animal fat in the renewable fuel sector was 512,000 metric tons, down 11 percent, while use of recycled oils in biofuel production was over 630,000 metric tons, up nearly 3 percent from 2015.

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Table 2. US production, consumption, and export of rendered products, 2011-2016 (000 metric tons)

Category	2011	2012	2013	2014	2015	2016	% Change 15/16
Production							
Tallow	2,646.2	2,617.6	2,598.2	2,449.7	2,393.9	2,559.5	6.9
Inedible tallow	1,650.7	1,632.9	1,620.7	1,528.1	1,493.3	1,587.4	6.3
Technical tallow	569.0	562.9	558.7	526.8	514.8	562.5	9.3
Edible tallow	426.5	421.9	418.7	394.8	385.8	409.6	6.2
Poultry fat	1,004.9	1,005.2	1,019.9	1,035.9	1,067.6	1,113.3	4.3
Yellow grease/used cooking oil	906.4	885.9	896.4	933.2	926.4	916.4	-1.1
White grease	721.5	737.1	735.1	724.1	776.7	787.6	1.4
Choice white grease	571.6	584.0	582.3	573.7	615.3	620.3	0.8
Lard	149.9	153.2	152.7	150.5	161.4	167.3	3.7
Other greases	345.2	346.7	344.9	332.1	339.9	336.0	-1.1
Subtotal	5,624.1	5,592.5	5,594.4	5,475.0	5,504.4	5,712.8	3.8
Meat and bone meal	2,624.0	2,635.3	2,621.5	2,524.2	2,583.5	2,711.5	5.0
Poultry by-product meal	1,258.9	1,259.3	1,277.7	1,297.7	1,337.4	1,382.1	3.3
Feather meal	482.5	482.7	489.7	497.4	512.6	527.2	2.8
Subtotal	4,365.4	4,377.2	4,388.9	4,319.4	4,433.5	4,620.8	4.2
Total	9,989.4	9,969.8	9,983.3	9,794.5	9,938.0	10,333.6	4.0
Consumption							
Feed, food, fatty acids, carryover, other	3,475.4	3,626.7	3,618.4	3,606.6	3,620.3	3,846.4	6.3
Tallow	1,792.3	1,880.9	1,939.7	1,845.4	1,791.0	2,005.6	12.0
Poultry fat	896.0	896.3	932.0	937.9	965.2	999.0	3.5
White grease	442.4	525.8	493.7	488.5	490.0	506.0	3.3
Yellow and other greases	344.7	323.8	252.9	334.7	374.1	335.9	-10.2
Biodiesel and renewable fuel	886.8	896.3	1,116.7	1,051.8	1,187.0	1,142.6	-3.7
Animal fat	584.7	461.3	500.7	468.5	572.7	512.3	-10.6
White grease	241.8	185.1	211.4	213.6	266.8	262.2	-1.7
Tallow	195.5	174.6	205.0	161.0	195.0	150.5	-22.8
Poultry fat	108.9	79.8	73.0	79.8	86.0	99.6	15.8
Other	38.6	21.8	11.3	14.1	24.9	n/a	
Recycled oils	302.1	435.0	616.0	583.3	614.3	630.3	2.6
Yellow grease/used cooking oil	213.6	303.9	475.4	493.5	558.9	630.3	12.8
Other	88.5	131.1	140.6	89.8	55.4	n/a	
Subtotal	4,362.1	4,523.0	4,735.1	4,658.4	4,807.3	4,989.0	3.8
Animal protein meals	3,267.0	3,336.9	3,319.2	3,258.3	3,273.2	3,265.7	-0.2
Feather meal	419.7	390.5	310.9	331.5	425.6	463.3	8.9
Subtotal	3,686.8	3,727.4	3,630.1	3,589.8	3,698.8	3,729.0	0.8
Total	8,048.9	8,250.5	8,365.2	8,248.1	8,506.1	8,718.1	2.5
Exports							
Yellow grease	566.2	452.1	361.0	333.1	253.0	286.2	13.1
Inedible tallow	598.4	486.7	382.3	402.5	343.1	283.3	-17.4
Edible tallow	60.0	75.4	71.1	40.8	64.8	120.1	85.5
Lard	34.8	24.8	29.4	21.4	19.7	19.1	-3.5
Poultry fat	n/a	29.1	14.9	18.2	16.4	14.7	-10.1
Choice white grease	2.5	1.4	0.5	0.6	0.2	0.4	85.2
Subtotal	1,261.9	1,069.5	859.3	816.7	697.2	723.8	3.8
Animal protein meals	615.8	557.6	580.0	563.7	647.7	827.9	27.8
Feather meal	62.8	92.2	178.8	166.0	87.0	63.9	-26.6
Subtotal	678.6	649.8	758.8	729.7	734.7	891.8	21.4
Total	1,940.5	1,719.3	1,618.1	1,546.3	1,431.9	1,615.5	12.8

Sources: Global Trade Atlas for exports, US Energy Information Agency for biodiesel inputs, and USDA/NASS - Fats and Oils: Oilseed Crushings, Production, Consumption, and Stocks Annual Summary for 2016 production.

Note: n/a = not available

Table 3. US annual livestock and poultry slaughter, 2011-2016 (thousand head)

Species	2011	2012	2013	2014	2015	2016	% Change 15/16
Broilers/Mature chickens	8,683,643	8,576,195	8,648,756	8,669,628	8,822,692	8,909,014	1.0
Cattle	34,087	32,951	32,462	30,266	28,843	30,565	6.0
Hogs	110,860	113,163	112,077	106,958	115,512	118,202	2.3
Turkeys	246,844	250,192	239,404	236,617	232,389	243,255	4.7

Source: USDA/NASS.

Domestic demand from both traditional uses and biofuel remained strong last year and continues to pull fat off the export market.

Domestic consumption of processed animal protein meals was almost 3.3 million metric tons in 2016, down slightly from 2015, while consumption of feather meal was 463,000 metric tons, up 9 percent. Exports of processed animal proteins were nearly 828,000 metric tons, up about 28 percent, yet feather meal exports were down 27 percent to 64,000 metric tons mainly because of decreased demand from Indonesia.

In 2016, prices for rendered fats rebounded whereas prices for processed animal proteins declined greatly. Increases in fat prices can be attributed to biodiesel and renewable fuel demand both in the United States and in export markets. On average, fat prices rose 12 percent in 2016 compared to 2015, yet processed animal protein and feather meal prices dropped 17 percent on average to levels not seen in over 10 years. The decreases are a result of low demand for animal proteins due to the previously mentioned all-vegetarian diet trend within the US poultry industry along with a greater supply of competing protein meals in the marketplace. Export markets for processed animal protein meals are now more important than ever to the US rendering industry.

Outlook

Cattle slaughter in 2016 rebounded, ending the downward cycle in the beef industry in previous years. According to USDA's Economic Research Service (ERS), beef production in the United States is predicted to grow 11 percent in the next 10 years. During the same time period, projections are for the production of pork to rise 14 percent, poultry to be up 10 percent, and turkey to increase 12 percent. Hence, the production outlook is very bullish for rendered products over the next 10 years.

However, the domestic demand for processed animal protein meals looks uncertain as more poultry operations are predicted to switch to an all-vegetarian diet for marketing reasons. Informa Economics estimates that in the next five years this trend will expand from 20 percent in broilers to 30 to 35 percent and from 25 percent to 50 percent in layers. Fat demand faces the same challenges regarding the all-vegetarian diets along with large increases in distillers corn oil production and consumption in the United States. However, unlike processed animal proteins, animal fat has additional demand from the oleochemical and biofuel industries both domestically and globally.

International Market Conditions

Protein Meals

Global demand for protein meals from the livestock, aquatic, and pet food sectors was very strong in 2016. According to the 2017 Alltech Global Feed Survey, global feed production set a new record in 2016 at over 1 billion metric tons, a 4 percent growth from 2015. The largest feed producer in the world is China, followed by the United States and Brazil. In addition, China is the largest importer of feed ingredients in the world. In 2016, China produced 187.2 million metric tons of feed, up 4 percent from 2015. As a region, Asia is the

largest feed sector, producing 367.6 million metric tons last year, 5 percent more than the previous year.

Feed production in Europe, the second largest producer by region, grew from 240.6 million metric tons in 2015 to 249.4 million metric tons in 2016, while North America, the third largest region, produced 191.1 million metric tons of feed last year, down 2.5 percent from the previous year. Feed production in Latin America, the fourth largest region, was 157.5 million metric tons in 2016, up 3.4 percent from 152.3 million metric tons in 2015. The modest expansion in the global feed sector reflects back on the added demand for feed ingredients produced by the rendering industry.

Globally, processed animal protein meals go primarily into poultry, aquatic, and pet food diets and to a lesser degree into swine rations with the largest growth market being aquaculture feed. Processed animal protein meals have nutritional and palatability advantages in aqua rations over vegetable-based diets and a price advantage over fish meal. Processed animal protein meals also have a sustainability advantage over these alternatives. Additionally, inclusion rates for processed animal proteins in aqua feed rations are normally higher than in terrestrial animal feeds, hence the aqua feed sector is an important market for renderers.

In 2016, global aqua feed production was 39.9 million metric tons, up more than 12 percent from 35.5 million metric tons in 2015. Poultry feed production last year was estimated at 451.6 million metric tons, down 3 percent from the previous year primarily due to the all-vegetarian diet trend in the United States along with increased efficiencies in the poultry industry. Pet food production was reported at 25.0 million metric tons, up 11 percent.

Total processed animal protein meal exports from the United States were almost 828,000 metric tons in 2016, up 28 percent from 2015. The largest importer was Indonesia with over 384,000 metric tons, up 35 percent. Exports to China grew a dramatic 121 percent last year, from 63,000 metric tons in 2015 to 138,000 metric tons in 2016. Exports to Mexico dropped 4 percent last year to approximately 100,000 metric tons while exports to Chile fell 50 percent due to decreased salmon production caused by algae blooms in production areas. Total US feather meal exports declined 27 percent in 2016. Overall prices in the protein meal sector have been soft because of an oversupply of inexpensive soybeans, dried distillers grains, and decreased domestic demand as mentioned earlier.

Fats and Greases

The export market for all US rendered fats showed slight improvement in 2016, growing 4 percent. Exports of inedible tallow, which includes technical tallow, continued to drop dramatically last year, falling 17 percent to 283,000 metric tons. This was due to increased domestic demand along with a large supply of competing oils such as palm and soybean in the global marketplace. Edible tallow exports grew 86 percent in 2016 to reach over 120,000 metric tons because of the explosive growth of exports to Mexico, while yellow grease exports were 286,000 metric tons, up more than 13 percent as a result of higher exports to Europe for use in biodiesel.

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Table 4. US export customers by product, 2011-2016 (in metric tons)

Product/Country	2011	2012	2013	2014	2015	2016	% Change 15/16
Inedible tallow							
Mexico	314,069	271,378	238,079	235,843	227,876	145,640	-36
Singapore	0	5,000	0	5,000	14,275	46,312	224
Canada	20,013	12,772	14,841	18,493	20,812	22,600	9
Guatemala	29,584	19,117	13,332	21,470	20,449	20,094	-2
Turkey	90,649	79,495	45,871	59,474	20,898	19,249	-8
Honduras	19,457	24,597	14,097	11,499	9,000	8,240	-8
Morocco	16,913	10,501	5,000	9,000	7,000	7,198	3
Dominican Republic	0	2,000	2,499	3,000	3,500	4,550	30
Nicaragua	8,098	7,749	3,199	4,325	3,700	3,550	-4
El Salvador	7,499	4,699	4,199	3,750	2,900	3,000	3
Finland	0	0	0	0	0	2,000	
Panama	400	400	0	800	800	500	-38
Haiti	7,540	1,750	4,519	8,348	917	275	-70
Colombia	8,099	7,199	3,899	6,100	8,000	78	-99
Dominica	2,799	4,199	4,649	2,800	2,800	0	
Trinidad and Tobago	997	122	179	264	205	0	
Venezuela	23,369	18,589	18,799	3,800	0	0	
Pakistan	4,000	0	4,000	8,000	0	0	
Nigeria	0	0	20	496	0	0	
Peru	21,981	15,000	4,080	0	0	0	
South Korea	17,800	2,000	0	0	0	0	
Total	598,355	486,735	382,263	402,548	343,130	283,284	-17
Yellow grease (includes used cooking oil)							
European Union-28	222,722	154,095	147,289	153,813	128,128	184,984	44
Mexico	131,831	113,534	95,892	95,574	72,564	50,014	-31
Canada	26,547	15,604	11,533	10,604	11,716	11,045	-6
Dominican Republic	30,460	17,629	18,082	15,518	9,585	10,639	11
Honduras	7,236	6,920	3,605	5,890	7,057	9,071	29
Guatemala	10,224	7,611	3,799	7,125	6,066	6,939	14
Bosnia and Herzegovina	1,608	520	1,567	499	3,883	1,846	-52
Trinidad and Tobago	1,572	1,455	2,447	1,144	2,193	1,568	-28
Singapore	706	1,656	2,593	2,675	1,755	1,541	-12
Jamaica	6,630	4,802	6,991	7,300	1,310	1,362	4
Colombia	578	584	388	439	593	1,350	128
El Salvador	11,239	3,695	3,599	3,526	511	651	27
South Korea	2870	385	502	552	961	353	-63
Haiti	5,292	5,284	1,250	1,250	947	76	-92
Venezuela	91,490	104,869	56,896	19,851	0	0	
Total	566,246	452,067	361,031	333,133	252,959	286,189	13
Edible tallow							
Mexico	54,459	70,205	66,278	35,840	61,076	114,154	87
Canada	5,283	5,163	4,870	4,807	3,657	5,706	56
Trinidad and Tobago	184	26	0	0	0	100	
Total	60,043	75,399	71,148	40,783	64,762	120,146	86
Lard							
Mexico	32,878	23,487	28,299	18,848	17,691	16,924	-4
Canada	1,016	598	596	612	393	988	151
Russia	0	0	0	0	301	829	175
Total	34,776	24,825	29,444	21,392	19,741	19,050	-4
Choice white grease							
China	-	27	38	0	58	136	134
Colombia	-	99	31	250	50	100	100
Mexico	-	92	33	208	27	67	148
Total	-	1,387	491	639	202	374	85
Poultry fat							
Canada	-	10,667	11,065	13,072	10,942	9,320	-15
Mexico	-	806	854	1,731	2,418	2,139	-12
Peru	-	-	0	0	0	958	
Dominican Republic	-	513	644	577	616	671	9
Guatemala	-	287	370	458	446	516	16
Spain	-	-	-	-	-	320	
Total	-	14,536	14,895	18,173	16,376	14,728	-10

Table 4. US export customers by product, 2011-2016 (in metric tons), continued

Product/Country	2011	2012	2013	2014	2015	2016	% Change 15/16
Animal protein meals							
Indonesia ¹	387,336	224,219	233,906	222,561	285,282	384,686	35
China	16,356	43,421	48,986	82,697	62,591	138,043	121
Mexico ²	91,425	99,049	83,334	74,866	103,779	99,581	-4
Canada	30,333	38,044	43,368	48,690	58,773	64,298	9
European Union-28	5,379	5,518	5,682	7,022	14,007	29,345	110
Chile ³	21,587	57,394	35,970	37,852	57,084	28,898	-49
Vietnam	3,017	2,050	1,780	1,613	8,201	28,387	246
Honduras	167	900	3,406	1,100	3,704	11,746	217
Ecuador ³	7,200	6,400	9,400	10,034	8,218	11,077	35
Philippines	4,466	33,035	29,704	12,462	10,734	8,990	-16
Guatemala	10	1,037	12,595	7,399	1,381	4,130	199
Malaysia	0	2,060	16,902	13,300	1,446	3,900	170
Costa Rica	1,948	349	781	749	1,176	3,800	223
Thailand	11,512	12,884	14,951	5,740	5,163	3,479	-33
Peru	337	680	1,156	994	846	2,646	213
Colombia	1,001	724	2,276	1,523	950	2,260	138
Bangladesh	0	1,277	3,425	1,505	3,820	1,501	-61
Brazil	-	76	-	-	256	296	16
Dominican Republic	1,773	881	-	307	1,352	14	-99
Total	615,784	557,608	579,967	563,706	647,708	827,889	28
Feather meal							
Indonesia	36,011	46,929	110,087	98,990	41,750	27,659	-34
Canada	11,632	17,035	8,961	16,227	15,573	16,879	8
Chile	13,697	25,667	52,972	48,135	24,403	10,046	-59
China	0	0	183	1,265	977	7,391	656
Vietnam	625	95	4,120	7	2,637	1,440	-45
Philippines	0	0	0	0	100	200	100
Colombia	0	0	0	-	-	150	
Total	62,791	92,195	178,815	165,952	87,000	63,873	-27

Source: Global Trade Atlas.

¹NRA estimates.²From Mexico customs office.³From Data Sur.**Market Report** *Continued from page 13*

Globally, the rendered fat market is increasingly becoming reliant on the biodiesel and renewable diesel industries both from direct demand and the rising interest for competing products like palm oil and soy oil. In the last five years, the use of animal fat in the global biodiesel industry has gone up 88 percent from 1.5 million metric tons in 2011 to 2.8 million metric tons in 2016. In addition, UCO consumption in the global biodiesel and renewable fuel industries grew 199 percent over the last five years from 1.1 million metric tons to 3.1 million metric tons. Combined, the demand for both UCO and animal fat was 5.9 million metric tons in 2016. This is a market that was virtually non-existent 10 years ago.

Even though tallow exports were down overall, there are two positive items to report in 2016. First, exports to Singapore grew to 46,000 metric tons in 2016, a 224 percent jump from 2015. Second, after more than 12 years of negotiations, the United States regained market access to China for tallow with the first US exporter registered in July 2016, followed by its first sale in August and its first shipment arriving at the soap buyer's factory in October.

The multi-year effort to gain market access into China would not have been possible without NRA's cooperative

relationship with USDA's Animal and Plant Health Inspection Service and Foreign Agricultural Service. NRA predicts that even though trade will begin slowly, exports of US beef tallow to China could reach \$3 million in 2017 and exceed \$10 million by the end of 2018.

Outlook

The supply outlook for rendered products shows growth over the next 10 years due to increased production of beef, swine, broilers, and turkeys. This increased meat output will result in more rendered product production leading to a larger supply of animal fats and proteins.

On the demand side, domestic use of rendered protein meals will continue to be under pressure as the all-vegetarian diet trend continues in the poultry sector adding importance to export markets. The global aquaculture and poultry markets will continue to expand along with pet food demand that is beginning to emerge in developing countries.

With regard to rendered fats, the traditional feed market will remain important especially due to the all-vegetarian trend in poultry and further replacement by distillers corn oil. Hence, demand from the oleochemical industry and the global biodiesel and renewable fuel industries remains very important.

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