

THE SOUTH AMERICAN MEAT INDUSTRY.

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IT is well known that the domestic supply of meat in the United States, especially of beef, has in recent years shown an alarming decrease, so much so, in fact, that for the first time in our history it has become necessary to look to the foreign field for relief. Certain distant countries, having sparse populations and vast herds and flocks combined with abundant natural grazing facilities, have now taken the place of the United States as the world's great source of the meat surplus. South America and the Australian colonies, particularly the former, have in the last decade produced immense quantities of beef and mutton for export, and already shipments have been received in our ports from these places, mostly of beef from Argentina, with a probability that the trade will soon grow to considerable proportions. In view of these facts, and pursuant to the instructions of the Secretary of Agriculture, an investigation of the South American meat inspection and meat industry was made by the writer in the late summer of 1913, the results of which, together with the main facts connected with live-stock conditions and the meat trade of the South American countries, are herewith given.

The investigation was undertaken primarily for the purpose of ascertaining at first hand whether the meat inspection was adequate and whether the conditions under which food animals were slaughtered and the meat prepared for export were such as would reasonably insure that the product was sound and healthful, as is required by our laws. To dispose of this point at the outset it may be stated that the official inspection of meat for export, as observed at the various establishments engaged in this trade, was on the whole satisfactory. Some more or less important details, however, were not in accordance with the practice of the Federal meat inspection as administered by this bureau, but in this connection it should

be said that the chief of the Argentine Bureau of Animal Industry was very desirous of having the inspection brought up to a standard satisfactory to the United States Government, and it was stated that a request has been made through the Argentine minister at Washington that an inspector of this Government be sent to Argentina to instruct the inspection authorities there in detail regarding such matters, the Argentine Government agreeing to pay his expenses.

Every facility and courtesy was extended by the Argentine Government in connection with the investigation, free railroad transportation was provided, and a veterinary inspector of the Argentine Bureau of Animal Industry, who was familiar with English, was detailed to act as guide.

The Federal Governments of both Argentina and Uruguay maintain veterinary inspection at all of the establishments exporting fresh meats, the Federal inspection being confined to animals and meats intended for export. Municipal abattoirs are maintained very generally at the more important South American cities, and local meat supplies are slaughtered at these places under municipal inspection.

IMPORTS OF FOOD ANIMALS AND MEAT PRODUCTS INTO THE UNITED STATES.

The fact that an import trade in food animals and meat-food products has already become well established is shown in the following statements, compiled from the records of this bureau, which cover the operations during six months, from October, 1913, to March, 1914.

Imports of food animals into the United States, October, 1913, to March, 1914.

Month and country of export.	Cattle.	Swine.	Sheep.	Goats.
1913.				
October:	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
Mexico.....	47, 442	119	40, 147	41, 542
Canada.....	80, 583	42	2, 841	5
Other countries.....	434	.....	24	2
Total.....	128, 459	161	43, 012	41, 549
November:				
Mexico.....	40, 825	410	27, 426	18, 793
Canada.....	40, 030	182	10, 027	.....
Other countries.....	2	.....	6	2
Total.....	80, 857	592	37, 459	18, 795

Imports of food animals into the United States, October, 1913, to March, 1914—
Continued.

Month and country of export.	Cattle.	Swine.	Sheep.	Goats.
1913.				
December:	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>	<i>Number.</i>
Mexico.....	69,544	211	33,737	22,449
Canada.....	14,010	4,241	280	1
Other countries.....	56	.....	17	7
Total.....	83,610	4,452	34,034	22,457
1914.				
January:				
Mexico.....	84,583	82	12,165	17,169
Canada.....	4,264	8,730	34	.....
Other countries.....	.....	.....	.....	.....
Total.....	88,847	8,812	12,199	17,169
February:				
Mexico.....	107,799	48	1,148	19,845
Canada.....	2,221	8,189	62	.....
Other countries.....	.....	.....	.....	.....
Total.....	110,020	8,237	1,210	19,845
March:				
Mexico ¹	33,097	64	2,036	13,174
Canada.....	3,584	8,192	17	.....
Other countries.....	.....	.....	.....	.....
Total.....	36,681	8,256	2,053	13,174

¹ The figures for Mexico for March are preliminary and subject to revision.

Imports of meats and meat food products into the United States, October, 1913,
to March, 1914.

Month and country of export.	Fresh and refrigerated meats.		Canned and cured meats.	Other products.	Total.
	Beef.	Other meats.			
1913.					
October:	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Argentina.....	2,069,794	.....	.....	46,070	2,115,864
Canada.....	2,337,272	6,900	148,127	8,809	2,501,108
Australia.....	653,145	2,179	152,280	.....	807,604
Uruguay.....	559,843	.....	.....	.....	559,843
Other countries.....	5,357	9,915	280	764	16,316
Total.....	5,625,411	18,994	300,687	55,643	6,000,735

Imports of meats and meat food products into the United States, October, 1913, to March, 1914—Continued.

Month and country of export.	Fresh and refrigerated meats.		Canned and cured meats.	Other products.	Total.
	Beef.	Other meats.			
1913.					
November:	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
Argentina.....	3, 988, 898	10, 204	31, 025	63, 709	4, 093, 836
Canada.....	4, 811, 998	179, 727	611, 701	21, 976	5, 625, 402
Australia.....	1, 681, 156	.....	236, 382	.....	1, 917, 538
Other countries.....	27, 252	14, 785	18, 035	124, 041	184, 113
Total.....	10, 509, 304	204, 716	897, 143	209, 726	11, 820, 889
December:					
Argentina.....	9, 440, 488	237, 422	130, 176	546, 588	10, 354, 674
Canada.....	2, 048, 475	149, 503	357, 178	46, 117	2, 601, 273
Australia.....	1, 286, 193	83, 868	484, 774	60	1, 854, 895
Uruguay.....	494, 454	.....	.....	.....	494, 454
Other countries.....	25, 417	347	105, 185	638, 275	769, 224
Total.....	13, 295, 027	471, 140	1, 077, 313	1, 231, 040	16, 074, 520
1914.					
January:					
Argentina.....	8, 935, 797	290, 317	16, 600	612, 990	9, 855, 704
Canada.....	595, 011	212, 320	251, 417	41, 837	1, 100, 585
Australia.....	2, 330, 699	418, 889	918, 454	.....	3, 668, 042
Uruguay.....	777, 033	.....	132, 978	.....	910, 011
Other countries.....	148, 453	4, 237	110, 054	199, 648	462, 392
Total.....	12, 786, 993	925, 763	1, 429, 503	854, 475	15, 996, 734
February:					
Argentina.....	4, 346, 565	.....	50, 801	222, 115	4, 619, 481
Canada.....	347, 933	278, 751	163, 974	19, 637	810, 295
Australia.....	977, 746	186, 300	671, 019	.....	1, 835, 065
Uruguay.....	2, 401, 855	892, 225	6, 759	.....	3, 300, 839
Other countries.....	.....	5, 881	67, 402	127, 323	200, 606
Total.....	8, 074, 099	1, 363, 157	959, 955	369, 075	10, 766, 286
March: ¹					
Argentina.....	20, 784, 393	1, 663, 542	102, 375	60, 120	22, 610, 430
Canada.....	540, 408	379, 641	260, 941	70, 873	1, 251, 863
Australia.....	1, 389, 877	478, 834	717, 765	21, 753	2, 608, 229
Uruguay.....	5, 783, 602	423, 804	72, 654	2, 400	6, 282, 460
Other countries.....	.....	11, 219	148, 422	106, 016	265, 657
Total.....	28, 498, 280	2, 957, 040	1, 302, 157	261, 162	33, 018, 639

¹ The figures for March are preliminary and subject to slight revision.

THE SOUTH AMERICAN EXPORT MEAT TRADE.

The only South American countries exporting refrigerated meats are Argentina and Uruguay. The large exporting establishments are situated mostly on the River Plate, and the frozen and chilled meats are in most cases loaded directly into the ocean steamers. The export trade in refrigerated meats owes its beginning and development to the invention by a French engineer, Charles Tellier, of a system for preserving fresh meats by refrigeration during the time required for the ocean voyage from South America to Europe. The pioneer steamship in this trade, *Le Frigorifique*, constructed with refrigerating facilities according to the Tellier system, made a successful trial voyage with fresh meat from Rouen, France, to Buenos Aires in 1876. In the following year this vessel and *Le Paraguay* began the transportation of frozen meat from Argentina to Europe under the respective management of two French firms, the Tellier and Jullien companies, which were given a five-year monopoly by the Argentine Government.

Incidentally it may be noted that Tellier, who was known as "the father of cold storage," recently died at an advanced age in Paris in the utmost poverty, having refused proffered assistance.

In 1883 the frozen-meat industry was definitely established in Argentina by the erection of the "Campana" plant, which was soon followed by other establishments.

In 1907 a United States packing firm acquired one of the Argentine plants, and four of the large establishments are now under United States ownership. English capital is also invested in several plants. The competition between the United States firms on the one hand and the native or Anglo-Argentine on the other is very keen. These establishments that prepare and export refrigerated meats are known as "frigoríficos." There are now 10 in Argentina and 2 in Uruguay, as shown in the following list, compiled from the report of the Argentine Commission to the recent Cold Storage Congress at Chicago. It is understood that two new plants in Argentina will soon be in operation also, namely, the Union Cold Storage Co., at Zárate, owned by an English firm, and the Compañía Frigorífico Santiago, at La Plata, owned by Armour & Co.

South American companies and establishments producing refrigerated meats for export.

Name of company.	Capital stock (gold) 1912.	Name of establishment.	Location.
The River Plate Fresh Meat Co. (Ltd.).	\$2, 250, 000	Campana.....	Province of Buenos Aires.
Compañía Sansinena de Carnes Congeladas.	4, 500, 000	La Negra.....	Do.
Do.....		Cuatreros.....	Do.
Do.....		Frigorífica Uruguaya..	Uruguay.
Las Palmas Produce Co. (Ltd.)....	2, 500, 000	Las Palmas.....	Province of Buenos Aires.
Compañía Argentina de Carnes Congeladas.	1, 500, 000	La Blanca.....	Do.
La Plata Cold Storage Co. (Ltd.)..	5, 000, 000	La Plata.....	Do.
Frigorífico Montevideo.....		Montevideo.....	Uruguay.
The Smithfield and Argentine Meat Co. (Ltd.).	1, 250, 000	Zárate.....	Province of Buenos Aires.
Sociedad Anónima Frigorífico Argentino.	2, 000, 000	Argentino.....	Do.
The New Patagonian Meat Preserving and Cold Storage Co. (Ltd.) (branch of La Plata).	2, 608, 607	Río Gallegos.....	Patagonia.
Do.....		San Julian.....	Do.

Regarding the United States ownership in the above South American refrigerating companies, from our present information it may be stated that the two establishments, La Plata and Frigorífico Montevideo, the latter in Uruguay, with the two branches in Patagonia, are owned by the Swift Company; the La Blanca plant is owned by Morris & Co. and Armour & Co., and the Frigorífico Argentino has been leased by the Sulzberger Company.

The following table shows the exports of Argentine refrigerated meat since the commencement of the trade. The increase in chilled beef with a corresponding decline in frozen beef exports in recent years shows a growing preference for the former. The great bulk of the exports has gone to England.



FIG. 1.—TYPE OF CATTLE SLAUGHTERED FOR THE EXPORT TRADE.



FIG. 2.—YOUNG CATTLE ON A TYPICAL RANCH IN THE ALFALFA REGION.
ARGENTINE CATTLE.

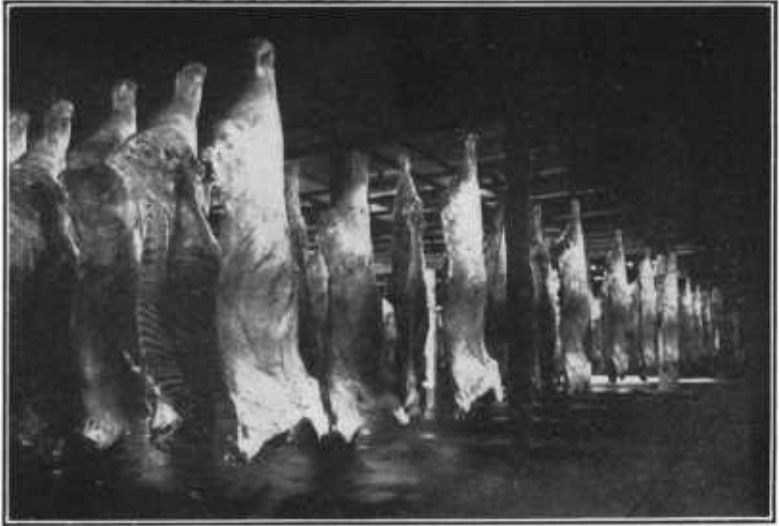


FIG. 1.—BEEF IN AN ARGENTINE FRIGORÍFICO.

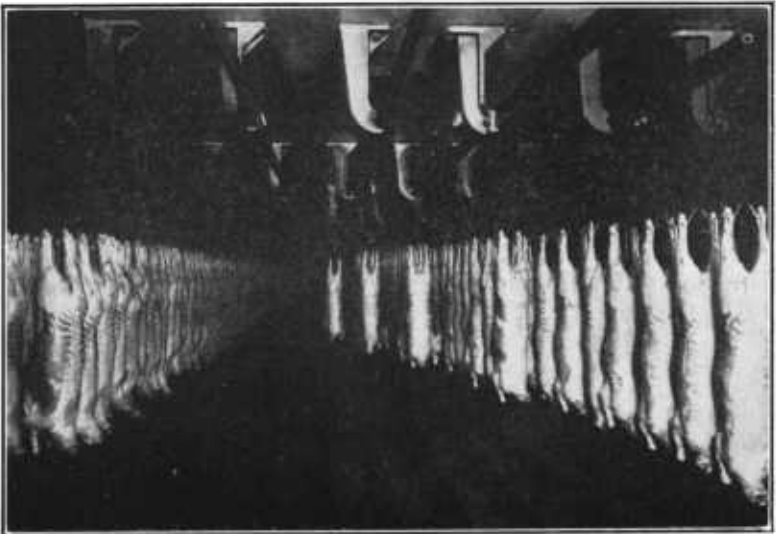


FIG. 2.—MUTTON IN AN ARGENTINE FRIGORÍFICO.

EXPORT MEAT IN ARGENTINA.

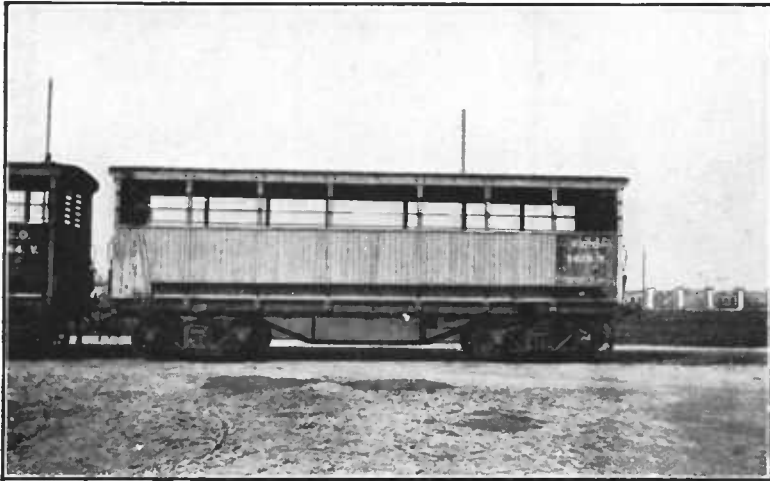


FIG. 1.—STOCK CAR.

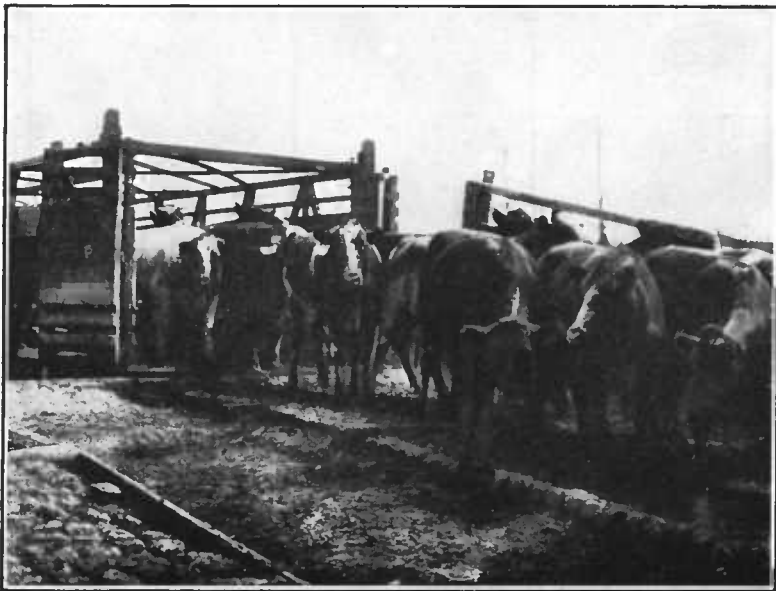


FIG. 2.—UNLOADING A TRAIN OF CATTLE FROM THE END CAR.
LIVE-STOCK TRANSPORTATION IN ARGENTINA.

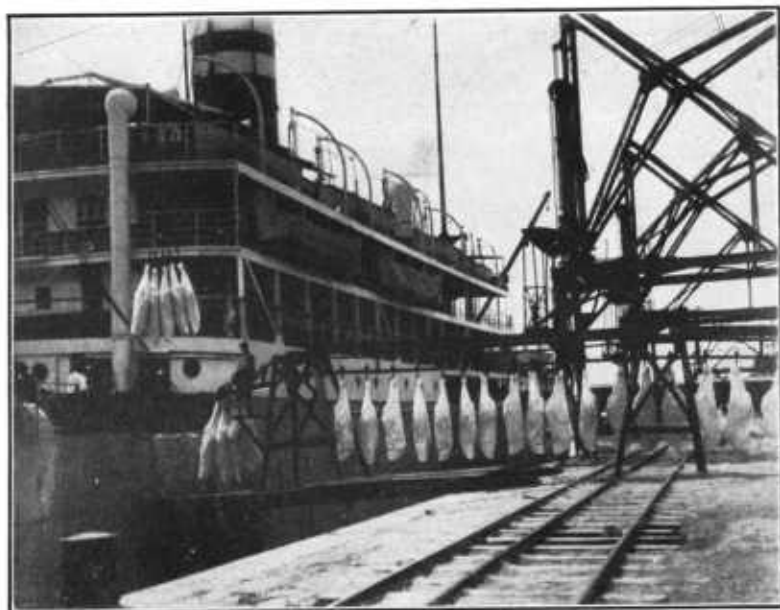


FIG. 1.—LOADING BEEF FOR EXPORT IN ARGENTINA.

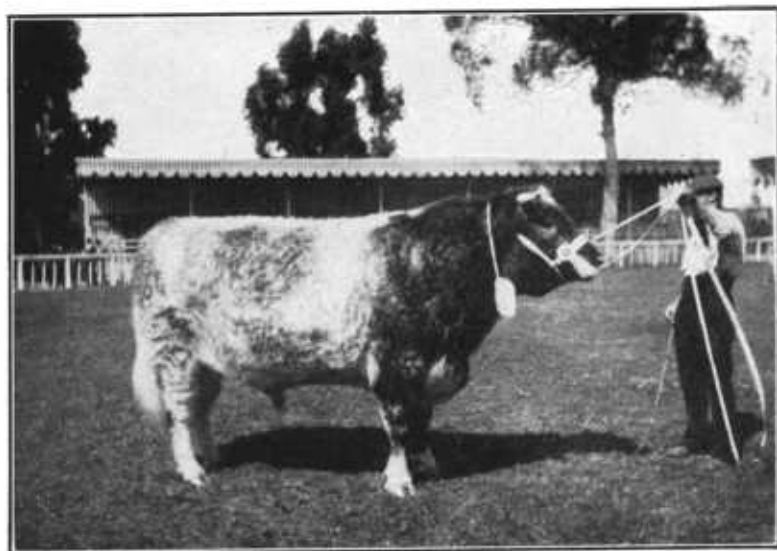


FIG. 2.—SHORTHORN BULL AT PALERMO STOCK SHOW, ARGENTINA. SOLD AT AUCTION FOR \$35,000 GOLD.

Argentine exports of beef and mutton.

Year.	Beef.		Mutton (frozen).	Year.	Beef.		Mutton (frozen).
	Frozen.	Chilled.			Frozen.	Chilled.	
	Quarters.	Quarters.	Carcasses.		Quarters.	Quarters.	Carcasses.
1884.....	112	.....	152,605	1899.....	113,984	.....	2,485,949
1885.....	1,193	.....	368,145	1900.....	266,283	.....	2,385,482
1886.....	3,702	.....	501,885	1901.....	479,372	24,919	2,755,788
1887.....	2,729	.....	553,297	1902.....	735,715	94,498	3,423,285
1888.....	2,908	.....	743,742	1903.....	877,342	142,542	3,427,783
1889.....	8,110	.....	848,277	1904.....	1,018,072	198,300	3,679,587
1890.....	1,003	.....	970,904	1905.....	1,533,745	426,002	3,346,670
1891.....	8,849	.....	968,695	1906.....	1,580,589	455,459	2,785,908
1892.....	11,824	.....	1,206,406	1907.....	1,403,835	849,613	2,802,014
1893.....	52,105	.....	1,299,605	1908.....	1,579,163	789,348	3,297,667
1894.....	3,735	.....	1,594,367	1909.....	1,615,888	1,071,474	2,723,870
1895.....	21,890	.....	2,022,650	1910.....	1,434,078	1,608,608	2,843,676
1896.....	37,420	.....	1,992,304	1911.....	1,693,494	2,131,791	3,497,639
1897.....	53,984	.....	2,155,169	1912.....	2,086,780	2,269,474	3,266,755
1898.....	71,463	.....	2,542,529	1913 (6 mos.)..	978,498	1,384,085	968,007

The following tables show the exports in detail of food animals and meat food products from Argentina in 1912; also the destination of the principal items as officially reported by the Argentine Government:

Exports of food animals and meat food products from Argentina in 1912.

Item.	Quantity.	Value (gold). ¹
Live animals:		
Cattle.....	number..	261,416
Sheep.....	do.....	104,898
Goats.....	do.....	7
Swine.....	do.....	9
Meat food products:		
Beef, chilled and frozen.....	tons..	342,851
Mutton, frozen.....	do....	70,175
Pork.....	do....	2,582
Tongues, conserved.....	do....	632
Dried beef (tasajo).....	do....	8,824
Other frozen meat.....	do....	15,661
Concentrated soup.....	do....	658
Canned meat.....	do....	17,699
Meat extract.....	do....	612
Powdered meat.....	do....	3,374
Lard.....	do....	3
Oleomargarin.....	do....	6,264
Oleo stock.....	do....	75,556
Total value.....	.....	70,869,199

¹ Argentine gold peso equals \$0.9647 United States.

Destination of principal meat food exports from Argentina in 1912.

Item.	United Kingdom.	Italy.	Belgium.	France.	United States.	Uruguay.	Brazil.
Cattle.....number.....		15, 689				90, 025	72, 103
Sheep.....do.....		15, 738	22, 785			37, 304	13, 888
Beef.....tons.....	303, 099	9, 522	25	192			
Mutton.....do.....	69, 534	70	11	405			
Pork.....do.....	176	277	936	252	679		6
Dried beef.....do.....	40			19	301		1, 913
Oleo stock.....do.....	29, 771	5, 096	3, 787	4, 368	1, 210		1, 037

The total value of all exports of animals and animal products from Argentina in 1912 as given in the report referred to was \$188,215,926 gold, an increase of \$19,821,223 compared with 1911. This total includes, however, not only food animals and meat food products, but various other animals and products, such as horses, hides, wool, leather, and sundry other inedible products.

PRICES OF ARGENTINE EXPORT CATTLE AND MEAT.

In September, 1913, cattle in Argentina that would dress about 800 to 820 pounds were selling on the hoof at \$70 to \$80 gold, with freight. This grade of Argentine beef, which is of very high quality, was selling in England for from 8 to 9 cents a pound wholesale. The London quotations of October 10, 1913, for South American dressed beef ranged from 6½ to 11 cents a pound for chilled beef and 6¼ to 8½ cents for frozen beef. Besides the price received for the meat there is a considerable return from the hide and offal, and since the entrance of American packers into the South American trade these by-products are being carefully prepared and utilized.

A very high quality of mutton is also produced in Argentina, but at this time shipments were scarce, on account of the floods which were quite prevalent in sections of the Province of Buenos Aires and farther south. London quotations for South American mutton October 10 were 8 to 8½ cents a pound. An idea of the quality of the Argentine export meat may be gained from Plates XLVII and XLVIII, although in regard to the cattle it may be said that those slaughtered

for the refrigerated trade are frequently in fatter condition than is seen in the illustration.

The relative prices of Argentine beef and mutton on the London market on October 10, 1913, as compared with the prices of high-grade meat in the principal markets of the United States and Europe at about the same date were as follows:

Wholesale prices per pound of beef and mutton in October, 1913.

BEEF.		
Chicago:		Cents.
Good native steers.....	sides..	12 $\frac{3}{4}$ -13 $\frac{1}{4}$
New York:		
Choice native heavy.....	do....	13 $\frac{1}{2}$ -14
London:		
English beef.....	do....	11 $\frac{1}{2}$ -13
South American chilled.....	hinds..	10-11
Do.....	fores..	6 $\frac{1}{2}$ -7
South American frozen.....	hinds..	8 $\frac{1}{4}$ -8 $\frac{1}{2}$
Do.....	fores..	6 $\frac{1}{4}$
Berlin:		
Fat oxen.....	sides..	19 $\frac{1}{2}$ -20 $\frac{1}{2}$
Paris:		
Beef.....	hinds..	9 $\frac{3}{4}$ -15 $\frac{1}{2}$
Do.....	fores..	6 $\frac{1}{4}$ -10 $\frac{1}{4}$
MUTTON.		
Chicago:		
Good sheep.....	carcass..	9 $\frac{1}{2}$
New York:		
Choice sheep.....	do....	10
London:		
English wethers.....	do....	13-15 $\frac{1}{2}$
South American frozen.....	do....	8-8 $\frac{1}{4}$
Berlin:		
Fat wethers.....	do....	18-20
Paris:		
First quality.....	do....	20-21

**THE QUARANTINE STATION FOR IMPORTED LIVE STOCK
AT BUENOS AIRES, ARGENTINA.**

The quarantine yards for imported live stock were visited on August 21, 1913. The station is situated alongside the docks. Government attendants unload the animals, which remain under their supervision and care until released from quarantine. Cattle are held in quarantine 30 days, sheep 15 days, and hogs 3 days from the time of landing. Neither

the owners nor any of their attendants are permitted within the quarantine premises. All temporary fittings upon the steamers are burned. Cattle are submitted to the tuberculin test and horses to the mallein test and all animals to a daily veterinary inspection. After unloading, all animals are submitted to external disinfection. Sheep are shorn and disinfected before being released from quarantine. Eleven camels were in quarantine at the time, having been imported from the Canary Islands to determine by experiment whether they may be used as beasts of burden in certain arid regions of the Republic.

LA TABLADA SHEEP YARDS

On August 25, 1913, a visit was paid to the sheep stock yards at La Tablada, about 12 miles from Buenos Aires. The average daily receipts are said to be about 7,000, although as high as 40,000 have been received in a single day. The receipts on the day of the visit were very light, being about 1,680, and had been disposed of before my arrival. Last year 4,500,000 sheep were received and during the first six months of this year 1,200,000 were handled. Veterinary inspection is maintained at these yards and a dipping vat is provided for treating infected and exposed sheep. Sheep that are to be removed to the country for feeding having been found scabby must be dipped twice at a cost of 15 cents (paper) per head each time, or the owner must pay a fine of 50 cents per head, submit to one dipping, and then sell the sheep for slaughter. These provisions apply in case a herd is found with over 5 per cent with scab. In case a less percentage is found the remedies are left to the discretion of the bureau. Scabies appears in the most aggravating form in the Lincoln breed, which is considered more susceptible to this disease than other breeds. Sheep are ordinarily transported in double-decked cars which do not have a roof. Sheep are bought in these yards for both local markets and frigoríficos.

THE VETERINARY COLLEGE OF THE ARGENTINE NATIONAL UNIVERSITY.

This school, which is located at La Plata, Argentina, was visited on August 26, 1913. Each student must take certain prescribed courses, which include dairying and animal husbandry. There are no electives. In the four years a course

in meat inspection is given. In general the various subjects are taught in separate buildings. The equipment is modern and apparently sufficient. A large clinic is also maintained, there being on hand at the time of our visit 60 patients. The school is under the direction of Dr. C. Griffin, an Argentinian, educated at home. Eighty students now attend. The writer was informed that there was another veterinary school in Argentina, near Buenos Aires, and also one at Montevideo, Uruguay, but it was impossible to arrange time to visit them.

TRANSPORTATION OF CATTLE TO THE FRIGORIFICOS.

The cattle slaughtered in the frigoríficos are usually shipped directly from the ranches to the establishments in trainload lots. The railroads make a minimum charge for a train of 20 cars of cattle, whether the train contains that many cars or not. Small lots of cattle which may go to public markets are charged for by the car and shipped in with other freight.

Cattle cars are arranged with the doors in the ends. In loading and unloading the train is backed up to the platform and the animals pass in and out at the end of the rear car and through that to and from other cars, the ends being arranged so as to open toward each other in the form of vestibules, allowing continuous passage from one end of the train to the other. Some of the cars are covered and some are not. They hold an average of about 17 fat cattle. The style of the cars and the method of unloading cattle are illustrated in Plate XLIX.

ARGENTINE CATTLE AND PASTURES.

Nearly all of the cattle slaughtered in the frigoríficos are either raised upon alfalfa pastures or are brought in from native grass pastures and finished on alfalfa. These cattle as a rule are highly bred, the principal breeds being the Durham (Shorthorn), Hereford, and Polled Angus, ranking numerically in the order named. As a rule these alfalfa pastures will maintain the year round one adult steer upon $2\frac{1}{2}$ acres of land, while in the fattening period this is increased to 3 to $3\frac{1}{2}$ acres. Usually no other feed is used to supplement the alfalfa pastures except in occasional times of drought or invasion of locusts, although some owners are beginning to finish their cattle on corn. With some cattle growers it is the practice to turn cattle for a short period on the native

grass pastures rather than keep them constantly on the alfalfa pastures, as they believe this is beneficial.

Alfalfa is not being grown nearly as extensively as it could be. The extension of its growth will depend very largely upon the prices that the cattle raisers receive for their cattle. Because of present satisfactory prices the tendency now is to convert the grain lands into alfalfa pastures. As cattle raising is a much more certain enterprise than grain growing, the people prefer to raise cattle when the prices are remunerative.

A visit was made to two large ranches in Argentina, namely, the establishment of Mr. Robert Murphy, "La Anita Rancho," at Cambaceres, in the Province of Buenos Aires, and that of Mr. James P. Cavanagh, at La Chispa, in Santa Fe Province. The illustration in Plate XLVII shows the nature of the land and the character of the cattle raised on these ranches, which are in the alfalfa district of Argentina. These ranches are typical of the establishments of the progressive cattle raisers.

Argentina for many years has been importing the best breeding cattle and sheep from Great Britain, and to-day has some of the finest types in the world. A visit was made to the National Live Stock Show at Palermo given by the Argentine Rural Society, also the fair at Rosario given by the Rural Society of the Province of Santa Fe. At Palermo the entries comprised 2,438 animals, including 1,334 cattle, 270 horses, 672 sheep, 151 swine, and 11 goats, besides 882 fowls. Most of the animals were pedigreed stock. A splendid example of the animals exhibited at Palermo is shown in Plate L, fig. 2. In order to avoid any possibility of favoritism, the judges for the show at Palermo were all brought from Europe for the special purpose of judging at this show.

It is the practice in Argentina for cattle growers to pay their taxes upon cattle at the time of selling them. This seems to be a fairer arrangement than to require stock owners to pay the tax on growing cattle from year to year.

ANIMAL DISEASES IN ARGENTINA.

Coccidiosis¹ and actinobacillosis² are quite common diseases among live stock in Argentina, and foot-and-mouth disease is also common, at some periods extending over a large section of the country. Tuberculosis is not prevalent except among dairy cows, work oxen, and bulls. Screw worms are a very common affliction and require close attention during the summer months. The bloating of cattle from alfalfa is not considered a very serious menace, most ranches keeping rock salt available for the cattle at all times and some placing this in their drinking troughs. When bloating occurs, the usual relief is furnished by puncturing the rumen with a long sheath knife, which all "gauchos" (cowboys) carry in the belt.

URUGUAY.

Uruguay has a good grade of cattle, but in general they are not equal to those in the alfalfa region of Argentina. The country, although very small in comparison with the neighboring Republics of Argentina and Brazil, nevertheless has an area of 72,210 square miles, a large proportion of which is well watered and naturally suited for stock raising, which is the principal industry. Furthermore, the southern part of the country is bounded by the River Plate, upon the other shore of which is Argentina, and in this vicinity are situated most of the great meat packing and exporting establishments. The Uruguayan Government, also, has in recent years been making a determined bid for a share of the export trade. It is therefore highly probable that the production of meat for the foreign trade will increase both in quantity and quality. Some examples of improved animals are seen in Plates LI, LII, and LIII.

¹ Coccidiosis is an infection of the intestinal tract by minute animal parasites known as coccidia.

² Actinobacillosis is a disease with lesions somewhat similar in appearance to those of lumpy jaw (actinomycosis). It is caused by a bacillus, while actinomycosis is caused by a fungus.

The following tables show the extent of the Uruguayan meat trade for a series of years:

Animals slaughtered and meat produced at frigoríficos in Uruguay.

Year.	Cattle.	Sheep.	Frozen beef.	Frozen mutton.	Other frozen meats.
			<i>Kilos.</i>	<i>Kilos.</i>	<i>Kilos.</i>
1905.....	3,982	72,421	1,006,717	1,644,158	98,773
1906.....	4,093	93,689	1,066,352	2,154,743	118,465
1907.....	12,104	117,400	3,170,248	2,873,722	209,837
1908.....	21,856	143,099	5,749,128	3,205,419	318,260
1909.....	26,711	150,358	6,973,571	3,353,005	367,623
1910.....	34,127	241,418	8,634,888	5,552,783	500,754
1911.....	23,231	288,465			
1912.....	68,481	333,544			
1913 (first half).....	69,512	258,094			

CURED OR SALTED BEEF ("TASAJO").

South American countries produce and export considerable quantities of cured or salted beef, known as "tasajo" or "jerked beef," much of which goes to Central America and Cuba. As an example of the importance of this industry, statistics of cattle slaughtered at the "saladeros" (salting establishments) of Uruguay are given in the following table:

Cattle slaughtered at Uruguayan saladeros.

Year.	Cattle.	Year.	Cattle.	Year.	Cattle.	Year.	Cattle.
1892.....	480,200	1898.....	496,700	1904.....	685,400	1910.....	609,390
1893.....	877,400	1899.....	684,300	1905.....	440,800	1911.....	446,600
1894.....	640,500	1900.....	597,500	1906.....	550,000	1912.....	577,31
1895.....	712,200	1901.....	512,000	1907.....	548,800	1913 (first	
1896.....	518,900	1902.....	557,500	1908.....	467,400	half)....	178,274
1897.....	570,400	1903.....	544,600	1909.....	544,900		

BRAZIL.

In Brazil observations were made in the cities of São Paulo, Rio de Janeiro, and Santos, and also on a cattle ranch in the interior.

The cattle of Brazil are not of such good quality as those of Argentina and Uruguay, and the stock is largely mixed

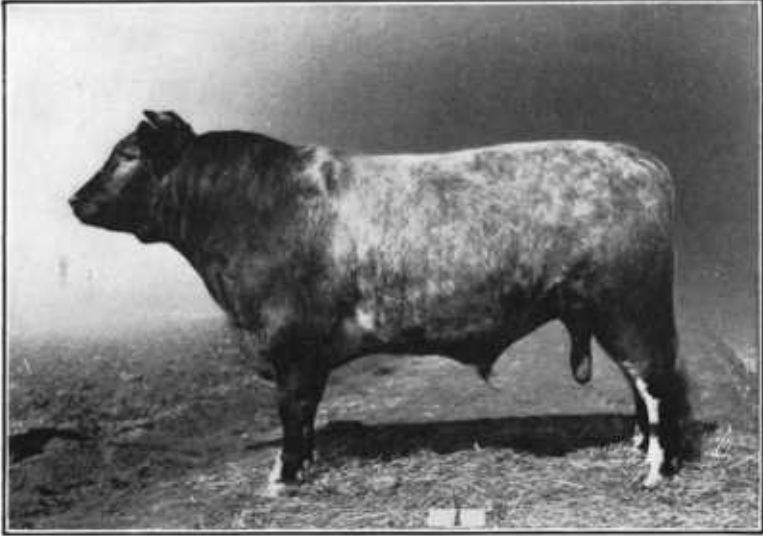


FIG. 1.—SHORTHORN BULL.

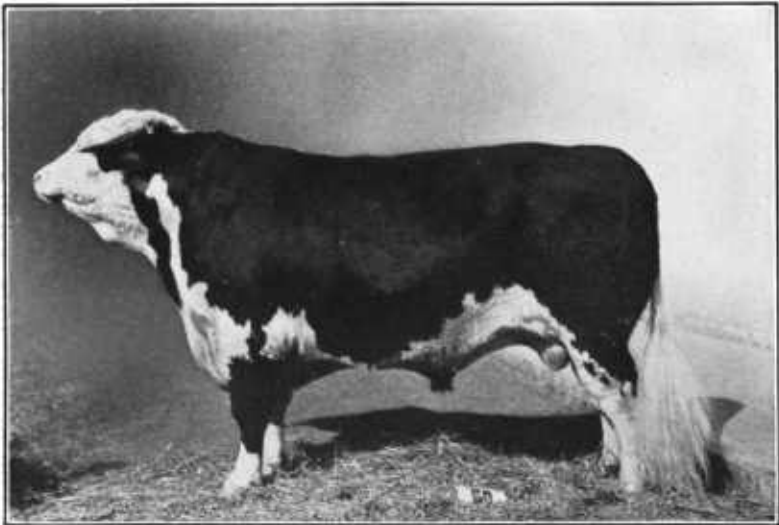


FIG. 2.—HEREFORD BULL.

PRIZE CATTLE AT STOCK SHOW IN URUGUAY.

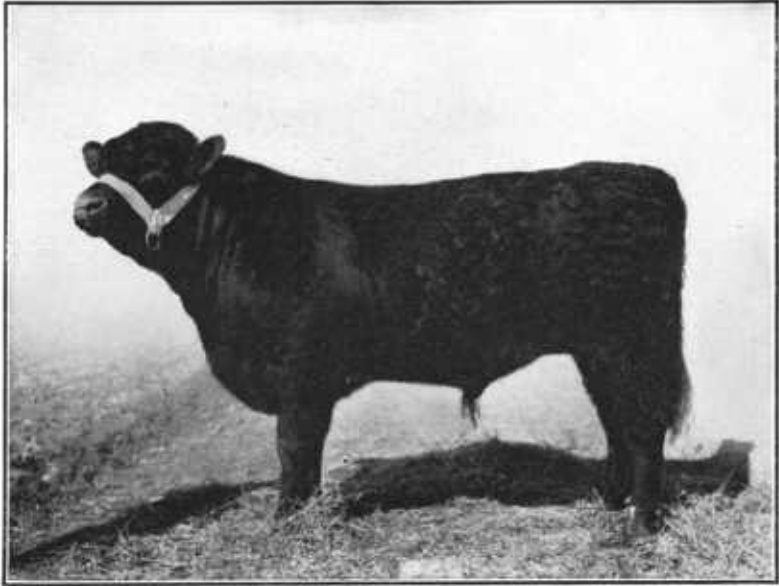


FIG. 1.—PRIZE ABERDEEN-ANGUS CALF.

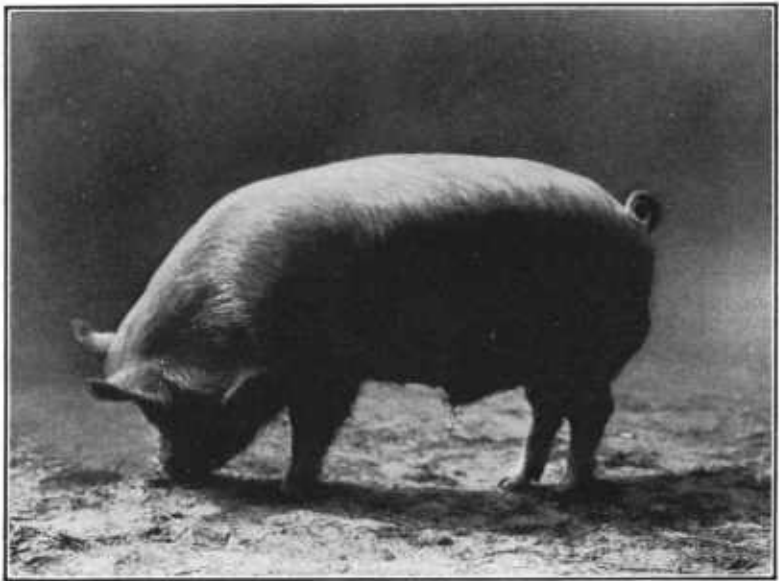
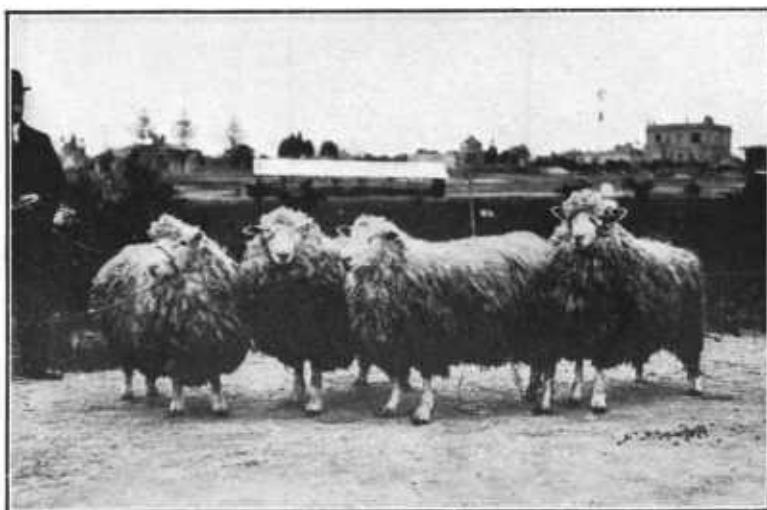


FIG. 2.--CHAMPION MIDDLE WHITE YORKSHIRE BOAR.
LIVE STOCK IN URUGUAY.



PRIZE SHEEP AT STOCK SHOW IN URUGUAY.

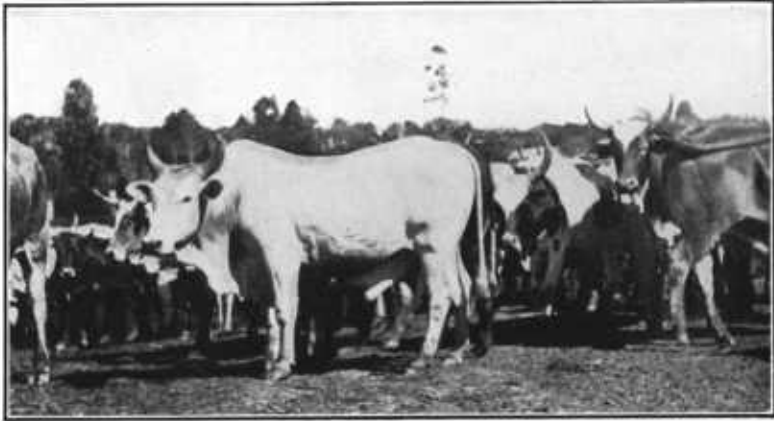


FIG. 1.—BRAZILIAN CATTLE FOR SLAUGHTER AT MUNICIPAL ABATTOIR, SÃO PAULO, BRAZIL.



FIG. 2.—SHORTHORN BULLS IMPORTED FROM THE UNITED STATES BY THE BRAZIL LAND, CATTLE, AND PACKING COMPANY.

CATTLE IN BRAZIL.

with the zebu or East Indian cattle. This zebu strain is very readily seen in most of the Brazilian cattle, and may be observed in some of the animals shown in Plate LIV, figure 1.

The ranch referred to is owned by the Brazil Land, Cattle & Packing Co., and is situated in the Province of Parana. This company has imported several hundred pure-bred Shorthorn and Hereford bulls and cows for the purpose of improving its cattle. These imported cattle were all immunized against Texas fever before leaving the United States, but besides this disease, which exists in Brazil as in the southern part of the United States, there is also said to be prevalent another disease very similar to Texas fever, known as anaplasmosis, which is also caused by a blood parasite transmitted by ticks. The immunization that the cattle received against Texas fever was not sufficient to protect them also against this other disease. Foot-and-mouth disease has also been quite prevalent at different times in Brazil. The imported cattle seem to have regained their vigor and are now in thriving condition. Some of the cattle on this ranch are shown in Plate LIV, figure 2.

There is no Federal meat inspection in Brazil, and no fresh meat is exported. The more important cities, however, have municipal abattoirs with inspection. At these abattoirs the owners of live stock are required to pay fees for slaughter and inspection. The municipality owns the abattoir and employs the butchers and inspectors. Rio de Janeiro has a fine municipal abattoir, recently completed, at which all of the slaughtering for the city is done.

Incidentally, there was seen at São Paulo the Government institute where snake venom is prepared for the treatment of persons bitten by venomous snakes.

PARAGUAY.

Paraguay exports no cattle or fresh meats. It has several "saladeros" (salting establishments producing "tasajo" or "jerked beef") and one extract and canning establishment. There is a good prospect of its becoming a cattle country for the grosser breeds of cattle.

STEAMSHIP TRANSPORTATION TO SOUTH AMERICA.

There is but one steamship company plying between Argentina and New York, namely, the Lamport & Holt Line, which at present has five vessels with a biweekly service. Two of these vessels are now equipped with refrigerator beef boxes, and it is understood that some of the others are to be likewise equipped. It was also said that this line would shortly acquire three vessels from the Nelson Line which are already equipped with refrigerators and which have been plying between South America and England.

Since many of the trans-Atlantic steamers are already equipped with refrigerator boxes, it would be very easy to supply United States markets with South American meats by transshipment by way of England, although this would probably call for a somewhat higher rate than direct shipments to the United States.

During 1912-13, according to the report of the Argentine Commission to the International Refrigeration Congress, there were 91 steamships equipped with refrigerating facilities and engaged in transporting chilled and frozen meat from Argentina to England. These ships have a storage capacity approximating 20,000,000 cubic feet, which is equivalent to space for between 300,000,000 and 400,000,000 pounds of meat.

Freight on the refrigerator steamers from Argentina to England is about 1 cent a pound.

THE SUPPLY OF CATTLE AND SHEEP IN SOUTH AMERICA.

The latest authentic statistics of the number of cattle and sheep in the principal stock-raising countries of South America are as follows:

Country.	Cattle.	Sheep.
Argentina (1908 census).....	29, 116, 625	67, 211, 754
Argentina (1912).....	29, 016, 000	¹ 80, 401, 486
Uruguay (1908 census).....	8, 192, 602	26, 286, 296
Brazil (estimated).....	25, 000, 000	.....
Paraguay (estimated).....	5, 500, 000	214, 060

¹ The estimate for sheep is for 1911.

For comparison the number of cattle and sheep in certain other countries of the world is given below:

Country.	Cattle.	Sheep.
North America:		
United States (1913).....	58,386,000	51,873,000
Canada (1912).....	7,103,702	2,393,950
Mexico (1902).....	5,142,457	3,424,430
Europe:		
United Kingdom (1912).....	11,909,469	28,951,469
France (1911).....	14,552,430	16,425,330
Germany (1912).....	20,158,738	5,787,848
Australasia:		
Australia (1911).....	11,358,977	92,897,368
New Zealand (1911).....	2,020,171	23,996,126

The proportion of cattle to population in various countries is shown in the following table:

Proportion of cattle to population and estimated surplus in principal countries.

Country.	Population.	Cattle per head of population.	Approximate annual surplus (+) or deficiency (-) ¹ .
South America:			
Argentina (1910).....	7,123,663	4.04	+4,739,596
Uruguay (1908).....	1,094,686	7.48	+1,482,126
Brazil (estimated).....	21,580,000	1.16	+1,917,000
Paraguay (estimated).....	800,000	6.87	+ 985,700
North America:			
United States (1912).....	95,410,503	.61	-1,952,872
Canada (1911).....	7,204,772	.99	+ 392,487
Mexico (1910).....	15,063,207	.34	- 477,830
Europe:			
United Kingdom (1911).....	45,365,599	.26	-4,098,906
France (1911).....	39,601,509	.37	-1,049,665
Germany (1910).....	64,925,993	.31	-2,460,851
Australasia:			
Australia (1911).....	4,918,707	2.31	+1,569,123
New Zealand (1911).....	1,021,066	1.97	+ 112,300

¹ This column is calculated on the basis of an annual increase of 20 per cent on the total cattle in each country, and on an annual allowance for home consumption of one-seventh of an animal per capita for all countries except Mexico, France, and Germany, for which the allowance is reduced to one-tenth.

THE FUTURE SUPPLY IN SOUTH AMERICA.

During the early part of the year there was considerable discussion in Argentina, Uruguay, and Brazil regarding the slaughtering of cows and calves and its effect in decreasing

the number of cattle. Many suggested that the slaughter of cows and calves be prohibited by law in order that the number of cattle might be increased. Several statements appeared in the press that Argentina and Uruguay had passed laws prohibiting the slaughter of female cattle. It appears, however, that this was not correct, but the subject was considered by the legislature of Argentina, and a committee was appointed by the Rural Society to investigate the matter. This committee reported that the increase in price which stock raisers were receiving for their cattle had produced the effect of stopping the slaughter of female cattle. On account of this increase in the price of cattle many are now converting the grain lands into alfalfa pasture lands as a means for increasing the number of cattle. No action was taken by the legislature, as it was believed that trade conditions would regulate the matter.

The export duty on live cattle from Uruguay was increased so as to avoid any depletion of the herds of that country.

In the State of São Paulo, Brazil, the legislature passed a law placing an export tax upon female cattle shipped out of that State, but providing that when such cattle were replaced by pure-bred cattle the tax was very much less.

While statistics show that Argentina is already slaughtering up to the limit of its present stock of cattle, that country has such great resources for cattle raising that it is easily possible for the stock raisers to bring about a large increase in the meat output if present prices are maintained, which, with the opening of the United States market, seems very probable.

The absence of American banks in these South American countries, and the lack of an American line of steamers, are handicaps to commerce between the United States and South America. The establishment of such banking and transportation facilities would probably be strong factors in promoting closer trade relations.

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