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South Dakota Stockman's Guide

I. B. Johnson

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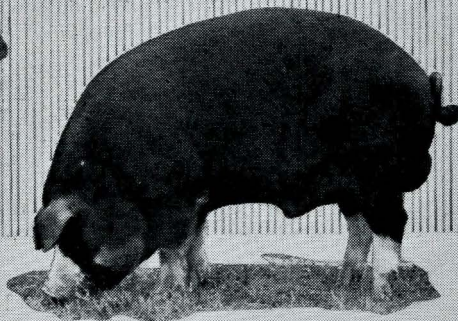
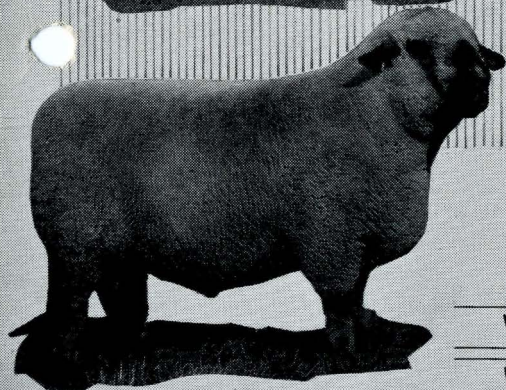
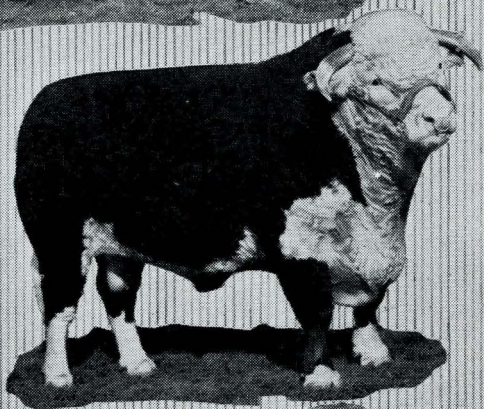
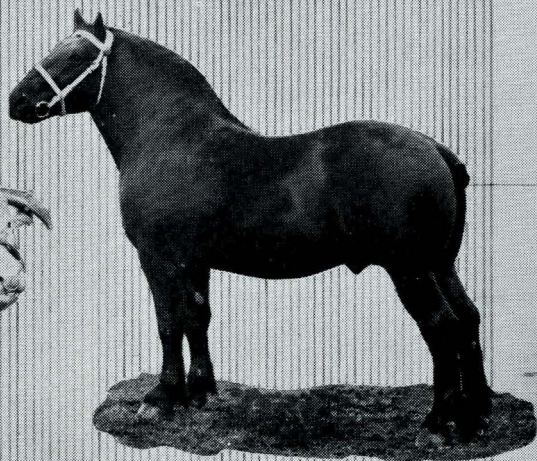
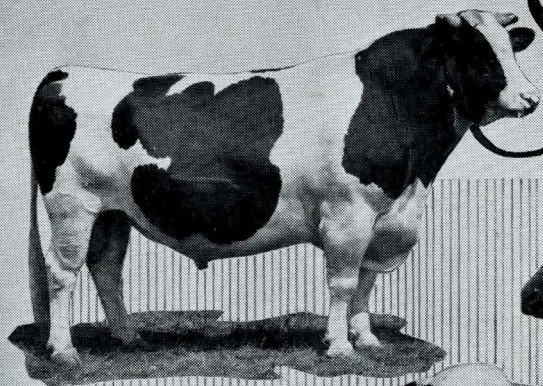
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South Dakota

STOCKMAN'S GUIDE



WE PAY FOR GOOD PUREBRED SIRE'S
WHETHER WE USE THEM OR NOT

A CIRCULAR OF USEFUL INFORMATION

SOUTH DAKOTA STATE COLLEGE
EXTENSION SERVICE
C. LARSEN, DIRECTOR
BROOKINGS, S. D.

FOREWORD

Livestock and livestock products provide approximately 75 per cent of the farm income for South Dakota farmers and ranchmen. The four most important factors in profitable livestock production in the state are breeding, feeding, management and marketing. If the Stockman's Guide serves as a ready reference concerning some of these factors, it will have fulfilled its mission.

In seeking better pure bred sires for the herd or flock or pure bred foundation stock the farmer wants to know from whom these animals may be purchased. Our constructive South Dakota pure bred livestock breeders are rendering a distinct service to the agriculture of the State and to the welfare of their communities in producing good pure bred livestock and are worthy of one's patronage. A printed list of these livestock breeders may be obtained by writing the Extension Animal Husbandman at South Dakota State College. The Extension Service will gladly aid any farmer or stockman, in so far as possible, with the solution of his livestock problems.

Acknowledgment is due Gerald Heebink, Extension Dairyman, and Dr. G. S. Weaver, Extension Veterinarian, for their services in compiling the sections on Dairy Cattle and Livestock Diseases.

The Stockman's Guide

By I. B. Johnson, Extension Animal Husbandman

Breeding and Feeding

LIVESTOCK PRODUCTION

Livestock	Number Head of Livestock for Every 1000 People in U. S. in			
	1900	1910	1920	1930
Cattle -----	750	630	650	470
Hogs -----	700	530	570	430
Sheep -----	600	510	380	410

ANNUAL PER CAPITA CONSUMPTION LIVESTOCK PRODUCTS

Pork -----	84. lbs.	Milk -----	55.3 gal.
Beef -----	49.6 lbs.	Butter -----	17.8 lbs.
Veal -----	6.9 lbs.	Cheese -----	4.3 lbs.
Lamb and Mutton -----	7.1 lbs.	Condensed and Evaporated Milk -----	14.3 lbs.
		Ice Cream -----	2.7 gal.

Pure Bred Sires Profitable

"You pay for a good purebred sire whether you use one or not" was the statement made by a successful South Dakota farmer. In your own neighborhood you can point to instances proving that statement. In a farm survey conducted by the U. S. Department of Agriculture to find the actual facts concerning the value of using good pure bred sires, the results showed that—

1. There was about 50 per cent average increase in the financial returns from their use.
2. Their offspring matured quicker and were better feeders.
3. With meat animals their offspring gained weight faster and cheaper and finished for the market earlier.
4. Their heifers were more certain to be good milkers and were more persistent in production.
5. Their offspring had a more ready sale and brought better prices.

In buying a pure bred sire, give attention to the breeding or production records of the sire's ancestors. Consider his pedigree, his offspring, then his type, and lastly the price that he will cost.

The Value of Pure Bred Livestock

"Based on utility alone—apart from breeding or sales value—pure bred livestock has an earning power from 33 per cent to 50 per cent greater than scrub stock. The average superiority of pure breds over scrubs for all classes of farm animals is about 40 per cent." This fact was proven by a survey conducted by the U. S. Department of Agriculture and set forth in one of their circulars. The utility value was represented by:

1. Better conformation and quality of the livestock.
2. Early maturity and ease of fattening and finishing.
3. More returns for the feed fed and more saleable livestock.
4. A better selling price for the livestock and livestock products.
5. A greater interest and pride on the part of the owner in producing better livestock.

NUMBER REGISTERED PUREBRED LIVESTOCK ON SOUTH DAKOTA FARMS
(U. S. Dept. of Commerce—Bureau of Census—April 1, 1930)

Beef Cattle:		Dairy Cattle:	
Aberdeen Angus	1,822	Ayrshire	312
Galloway	76	Brown Swiss	488
Hereford	17,252	Guernsey	1,203
Polled Hereford	331	Holstein-Friesian	6,516
Polled Shorthorn	632	Jersey	595
Shorthorn	11,171		
Dual Purpose Cattle:			
Milking Shorthorn	1,047		
Red Polled	808		
Hogs:		Horses:	
Berkshire	102	American Saddle	6
Chester White	1,571	Belgian	263
Duroc Jersey	4,289	Clydesdale	37
Hampshire	1,846	Percheron	1,374
Poland China	4,484	Shire	146
Spotted Poland China	1,461	Standard Bred	24
Tamworth	3	Thoroughbred	101
Sheep			
Cheviot	13		
Corriedale	132		
Cotswold	50		
Dorset	160		
Hampshire	818		
Karakul	3		
Lincoln	39		
Merino	142		
Oxford	26		
Rambouillet	1,849		
Shropshire	1,845		
Southdown	12		

BREEDING TABLE

Approximate Age of First Mating			Oestrus (heat)			
Animal	Average age (months)	Best age to breed (months)	Duration (days)	Repeats (weeks)	Occurs after parturition	Time to mate after parturition
Jennet	12	24 to 36	3 to 7	3	3 to 17 days	ninth day
Mare	10	24 to 36	3 to 7	3	3 to 17 days	ninth day
Cow	10	18 to 24	1 to 3	3	28 days	6 to 8 weeks
Sow	6	9 to 10	1 to 5	3	3 to 9 days	8½ weeks
Ewe	6	18 to 20	1 to 3	2 to 3	6 to 7 mo.	summer and fall

GESTATION PERIOD

	Weeks	Days
Sow	16	112
Cow	40½	283
Ewe	22	150
Mare	48½	340
Jennet	52	365

MATING TABLE

Showing number of females to each male

Horses—	
2-yr. old stallion	10
3-yr. old stallion	30
4-yr. old stallion	50-75
Cattle—	
Yearling bull	30
2-yr. old bull or over	50-75
Hogs—	
Boar pig	15
Yearling boar or over	30-40
Sheep—	
Lamb ram	10
Yearling ram or over	30-50

GESTATION TABLE

Date of Service	Probable Date Animal Due to Give Birth			
	Cow	Mare	Sow	Ewe
Jan. 1	Oct. 10	Dec. 6	April 22	May 30
Jan. 11	Oct. 20	Dec. 16	May 2	June 9
Jan. 21	Oct. 30	Dec. 26	May 12	June 19
Jan. 31	Nov. 9	Jan. 5	May 22	June 29
Feb. 10	Nov. 19	Jan. 15	June 1	July 9
Feb. 20	Nov. 29	Jan. 25	June 11	July 19
Mar. 2	Dec. 9	Feb. 4	June 21	July 29
Mar. 12	Dec. 19	Feb. 14	July 1	Aug. 8
Mar. 22	Dec. 29	Feb. 24	July 11	Aug. 18
April 1	Jan. 8	Mar. 6	July 21	Aug. 28
April 11	Jan. 18	Mar. 16	July 31	Sept. 7
April 21	Jan. 28	Mar. 26	Aug. 10	Sept. 17
May 1	Feb. 7	April 5	Aug. 20	Sept. 27
May 11	Feb. 17	April 15	Aug. 30	Oct. 7
May 21	Feb. 27	April 25	Sept. 9	Oct. 17
May 31	Mar. 9	May 5	Sept. 19	Oct. 27
June 10	Mar. 19	May 15	Sept. 29	Nov. 6
June 20	Mar. 29	May 25	Oct. 9	Nov. 16
June 30	April 8	June 4	Oct. 19	Nov. 26
July 10	April 18	June 14	Oct. 29	Dec. 6
July 20	April 28	June 24	Nov. 8	Dec. 16
July 30	May 8	July 4	Nov. 18	Dec. 26
Aug. 9	May 18	July 14	Nov. 28	Jan. 5
Aug. 19	May 28	July 24	Dec. 8	Jan. 15
Aug. 29	June 7	Aug. 3	Dec. 18	Jan. 25
Sept. 8	June 17	Aug. 13	Dec. 28	Feb. 4
Sept. 18	June 27	Aug. 23	Jan. 7	Feb. 14
Sept. 28	July 7	Sept. 2	Jan. 17	Feb. 24
Oct. 8	July 17	Sept. 12	Jan. 27	Mar. 6
Oct. 18	July 27	Sept. 22	Feb. 6	Mar. 16
Oct. 28	Aug. 6	Oct. 2	Feb. 16	Mar. 26
Nov. 7	Aug. 16	Oct. 12	Feb. 26	April 5
Nov. 17	Aug. 26	Oct. 22	Mar. 8	April 15
Nov. 27	Sept. 5	Nov. 1	Mar. 18	April 25
Dec. 7	Sept. 15	Nov. 11	Mar. 28	May 5
Dec. 17	Sept. 25	Nov. 21	April 7	May 15
Dec. 27	Oct. 5	Dec. 1	April 17	May 25

Suggestions for Economical Feeding

1. Home grown feeds are cheapest, but may need to be balanced with feeds high in protein for most profitable results.
2. A well balanced ration that has variety and is palatable will produce the best results.
3. Regularity in time of feeding pays well for the effort expended.
4. Sudden changes in feeding are objectionable; any changes should be made gradually.
5. Routh treatment and excitement prevent the best results in feeding.
6. Underfeeding is as uneconomical as overfeeding is wasteful.
7. Supply the livestock with sufficient water.
8. Permit the livestock to have access to salt and minerals.
9. Creep feeding the young growing animals will usually be found profitable.
10. Plan your farm business so that the livestock can harvest as much of the crop as possible.

Explanation of Feeding Terms

Concentrates are feeds that are rich and concentrated, furnishing a large amount of feed per unit of weight such as corn, grain, middlings, linseed meal, cottonseed meal and tankage.

Roughages are feeds that are coarse and bulky such as the hays, straws, roots and silage.

Legumes are plants such as the clovers, alfalfa or soybeans that are richer in protein and minerals than other roughages.

Nutrients are substances in the feeds that nourish animals such as the protein, carbohydrates and fat, minerals and vitamins.

Protein is the nutrient that produces growth and makes repairs in the animal's body. Large amounts of it may be found in lean meat, wheat bran, middlings, alfalfa leaves, linseed meal, cottonseed meal and tankage.

Carbohydrates and Fat are the nutrients that produce fat, heat, and power to do the work in the animal's body. Fat is two and one-fourth times as valuable for this as carbohydrates. Large amounts of carbohydrates are found in feeds rich in starch and sugar such as corn, the grains and hay, while large amounts of fat are found in oily feeds such as flax seed, cotton seed, soybean seed and corn germ meal. Corn is rich in both carbohydrates and fat.

Mineral Matter is the nutrient used mainly to build the skeleton, hair, hoof, horn, etc. Large amounts of it are found in legume hay, bran, linseed meal, skim milk and steamed bone meal.

Vitamins are the nutrients found in feed but not shown by analysis. They are necessary for growth, reproduction, and protection against ailments and diseases. Feeds such as whole milk, yellow corn, legume hay, pasture and green forages contain the vitamins in sufficient amounts for livestock. Sunshine and cod liver oil also supply certain vitamin substances.

Total Digestible Nutrients are the total amount of digestible protein, carbohydrates, and fat (in terms of carbohydrates) in a given amount of feed.

Ration is the term designating the amount of feed given an animal during one day.

Balanced Ration is a ration that contains the right proportion of nutrients to properly nourish the animal or animals to which it is fed.

Feed Analysis

The feeds produced on our South Dakota farms contain sufficient carbohydrates and fat but a scarcity of protein, therefore the amount of digestible protein in feed that has to be purchased is one of the best measures of value for that feed. In the two tables that follow are listed the concentrates and roughages of low and high protein content. Such a list is of importance in comparing relative values of feeds and in planning rations.

DIGESTIBLE PROTEIN CONTENT OF CONCENTRATES

(Figures following each feed show Total Digestible Nutrients in 100 pounds of the feed)

Low Protein		High Protein	
About 4 per cent		About 15 per cent	
Dried beet pulp	71	Corn germ meal	82
Skim milk	9	Red dog flour	79
About 6 to 9 per cent		Wheat middlings or shorts	69
Buckwheat	63	About 20 per cent	
Corn	85	Flax seed	100
Corn and cob meal	78	Gluten feed	80
Hominy feed	84	About 30 per cent	
Sorghum grain	79	Gluten meal	80
About 9 to 12 per cent		Linseed meal	77
Barley	80	Soybeans	94
Buttermilk (semi-solid)	36	About 35 per cent	
Emmer	76	Cottonseed meal	78
Oats	70	Meat meal	61
Rye	81	About 40 per cent	
Wheat	80	Fish meal 40 per cent	58
Wheat bran	60	Tankage 60 per cent	71

DIGESTIBLE PROTEIN CONTENT OF ROUGHAGES

(Figures following each feed show Total Digestible Nutrients in 100 pounds of the feed)

Low Protein		High Protein	
About 1 per cent		About 7 per cent	
Pumpkins -----	6	Alsike clover hay -----	47
Root crops -----	8 to 14	Red clover hay -----	50
Silage -----	17	About 10 per cent	
Straw -----	36 to 45	Alfalfa hay -----	51
About 3 per cent		Oat and pea hay -----	48
Corn fodder -----	53	Soybean hay -----	53
Corn stover -----	46	Sweet clover hay -----	50
Sorghum fodder -----	52	About 15 per cent	
Prairie hay -----	47	Alfalfa leaves -----	60
Timothy hay -----	48	Canadian field pea hay -----	56
About 5 per cent			
Clover and timothy hay -----	46		
Grain hay -----	46 to 54		
Millet hay -----	55		
Oat feed -----	43		
Redtop hay -----	53		
Russian thistle hay -----	39		
Wheat grass hay -----	56		

AVERAGE WEIGHT OF FEEDING STUFFS

Feeding Stuff	One Quart Weighs Pounds	One Pound Measures Quarts	Feeding Stuff	One Quart Weighs Pounds	One Pound Measures Quarts
Beet pulp, dried -----	0.6	1.7	Oat feed -----	0.8	1.3
Corn, whole -----	1.7	0.6	Rye, whole -----	1.7	0.6
Corn, meal -----	1.5	0.7	Rye, meal -----	1.5	0.7
Corn, bran -----	0.5	2.0	Rye, bran -----	0.6	1.8
Corn and cob meal -----	1.4	0.7	Rye, middlings -----	1.6	0.6
Gluten meal -----	1.7	0.6	Barley, whole -----	1.5	0.7
Gluten feed -----	1.3	0.8	Barley, meal -----	1.1	0.9
Germ meal -----	1.4	0.7	Buckwheat -----	1.4	0.7
Hominy feed -----	1.1	0.9	Buckwheat middlings -----	0.9	1.1
Flaxseed -----	1.6	0.6	Millet seed -----	1.6	0.6
Wheat, whole -----	2.0	0.5	Soy beans -----	1.8	0.6
Wheat, ground -----	1.7	0.5	Alfalfa meal -----	0.6	1.7
Wheat, bran -----	0.5	2.0	Molasses -----	3.0	0.3
Wheat middlings (stand) -----	0.8	1.3	Linseed meal, old process -----	1.1	0.9
Oats, whole -----	1.0	1.0	Linseed meal, new process -----	0.9	1.1
Oats, ground -----	0.7	1.4	Cotton-seed meal -----	1.5	0.7

COST COMPARISON OF GRAINS

(Total Digestible Nutrients)

When a Bushel of Grain Costs	One Hundred Pounds of Total Digestible Nutrients in Each of the Grains Listed Costs as Follows					
	Corn	Wheat	Barley	Oats	Rye	Emmer
\$.30	\$.65	\$.63	\$.76	\$1.30	\$.65	\$.98
.40	.87	.83	1.00	1.80	.87	1.30
.50	1.00	1.00	1.30	2.20	1.10	1.60
.60	1.30	1.30	1.50	2.70	1.30	2.00
.70	1.50	1.50	1.80	3.00	1.50	2.30

COST COMPARISON OF SOME COMMERCIAL FEEDS
(Protein Basis)

When a Ton of Feed Costs	One Hundred Pounds of Protein in Each of the Following Feeds Costs:					
	Wheat Bran	Middlings or Shorts	Tankage 60 %	Linseed Oilmeal	Cottonseed Meal or Cake	Gluten Feed
\$10.00	\$.80	\$.70				\$.60
20.00	1.60	1.40	\$1.40	\$1.30	\$1.30	1.20
30.00	2.30	2.10	2.10	1.90	1.90	1.80
40.00			2.80	2.60	2.50	2.50
50.00			3.50	3.20	3.10	

Comparative Cost of Grains as Livestock Feeds

With a bushel of corn selling at prices indicated in the first column, the other grains are economical feeds when selling at or below the figures indicated on the same line. Grinding costs of 5 cents per bushel should be deducted.

Relative Values for Cattle, Sheep and Horses, Wheat and Oats Do Not Apply to the Hogs, But the Rest Do					Relative Value Wheat and Oats for Hogs	
Corn	Wheat	Barley	Oats	Rye	Wheat	Oats
\$.20	\$.21	\$.16	\$.10	\$.18	\$.20	\$.10
.30	.32	.24	.15	.27	.30	.14
.40	.43	.32	.20	.36	.40	.19
.50	.54	.40	.24	.45	.50	.23
.60	.64	.48	.29	.54	.60	.28
.70	.75	.56	.34	.63	.70	.32
.80	.86	.64	.39	.72	.80	.36

CAPACITIES OF SILOS

Depth of Silage After Settling	Capacity in Tons—Inside Diameter					
	10 ft.	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
20	26					
22	30					
24	34	49				
26	38	55				
28	42	61	83			
30	47	67	91			
32		74	100	131		
36		87	119	155	196	
40			138	180	228	281
42				193	245	302
44				207	262	323
46					280	345
48						368

Depth of silo should not be more than 3 times diameter nor less than twice diameter.

The weight per cubic foot increases with the depth, being less than 20 pounds at or near the surface, and 61 pounds at the depth of 35 feet. The mean weight of silage for whole, where depth of silo is—

Depth of Silage in Feet	Mean Weight lbs. per cu. ft.
1	18.7
5	22.1
10	26.1
15	29.8
20	33.3
25	36.5
30	39.6
35	42.8

FEEDING VALUE OF SILAGE CUT AT DIFFERENT STAGES OF GROWTH

Kind of Silage	Pounds Silage Per Head Daily	Average Daily Gain Per Head	Average lbs. Silage Per lb. Gain
Frosted corn -----	56.2	2.09	26.9
Glaze or Dent stage -----	71.7	2.28	31.4
Dough stage -----	73.4	2.27	32.1
Blister or milk stage -----	76.9	1.94	39.8

Average results of 2 feeding periods of 119 and 90 days in 1916-17 and 1917-18. Five steers in a lot, each averaging 840 lbs.

South Dakota Exp. Sta. Bul. 182

Beef Cattle

The Trend in Beef Production

What kind of beef does the consuming public want? The demand is for the smaller cuts and consequently the trend in beef production is toward baby beef. The production of feeder calves is more economical for the ranchman and the feeding of these calves is more economical for the corn belt feeder. There will always be a certain demand for heavier fat cattle but it is limited and most generally readily supplied. The market demand is for the handy weight, good quality cattle, which emphasizes more and more the necessity of using good quality beef bulls and cows.

*RANGE PRODUCTION OF BEEF—MARKETING AT DIFFERENT AGES (Based on Range with 360 Head Capacity)

Cattle Marketed as	Range Capacity (360 Head)	Head Marketable Annually	Average Weight	Total Weight
3 year olds	119 cows (83 calves) 81 yearlings 79 2-yr. olds 77 3-yr. olds	77	1140	87,780
2 year olds	151 cows (106 calves) 103 yearlings 101 2-yr. olds	101	940	94,940
Yearlings	210 cows (147 calves) 145 yearlings	145	700	101,500
Calves	360 cows (252 calves)	252	400	100,800

* John T. Caine, Ill., 21st Annual Convention, Amer. Nat'l Livestock Assoc.

Comparisons in Feeding Period

The following results from the Indiana Experiment Station show the comparative amount of grain to finish calves, yearlings and two year olds.

	Calves 9 months	Yearlings 6½ months	2-year Olds 6 months
Length of feeding period -----	9 months	6½ months	6 months
Pounds of gain -----	507	433	468
Bushels of corn consumed -----	54	54	57

There was little difference in the amount of roughage consumed per head by the yearlings and two year olds while the calves consumed about three-fourths as much as either.

LENGTH OF FATTENING PERIOD

Mature feeders	-----	2 to 4 months
Two-year olds	-----	5 to 7 months
Yearlings	-----	6 to 9 months
Calves	-----	9 to 12 months

Getting Cattle on Feed

Feeder cattle from the range section are usually not accustomed to eating grain. They can be taught to eat corn more readily if turned out into stalk fields or if fed corn fodder on grass pasture. Practical cattle feeders plan to take 15 to 20 days to get short fed cattle on feed and from 30 to 40 days for long fed cattle or those fed more than 120 days. The cattle can be fed what roughage they will eat right from the start without any bad results. The feeding of silage makes it easier to get cattle on feed and the use of linseed meal or cottonseed meal will aid in getting them on feed quicker.

Start with 2 or 3 pounds of corn per head daily and increase the corn 1 pound per head daily the first week. After that the increases should be slower, say 2 pounds of corn for every 5 days until the cattle are on full feed. As the feeding period advances the cattle may eat more or less concentrates, but as a rule it will be more concentrates and less roughage. As one successful feeder put it "Watch the feed racks, the feed bunks and the cattle." In other words see that feed bunks are cleaned out; be regular in your feeding, guard against the cattle going off feed and keep them gaining from the time they go into the feed lot until they are ready for the market.

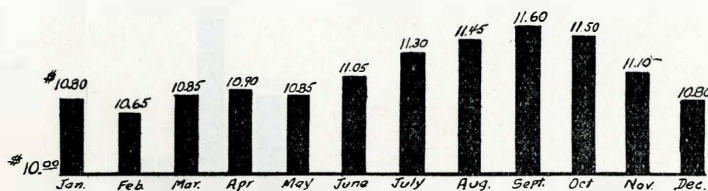
Rations for Beef Cattle

Pasture and roughages should be the foundation of beef cattle production. Pasture and silage are the cheapest feeds. In fattening cattle, heif-

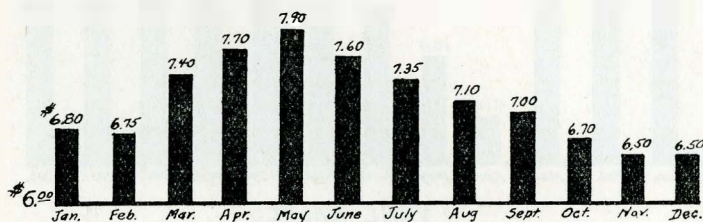
AMOUNTS FOR 1000 LBS. LIVEWEIGHT

Class of Cattle	With Silage	lbs.	Without Silage	lbs.
Calves: 250-400 lbs. each			Legume hay	5
			Oats and corn	10
			Linseed meal	1
6 months old	Silage	15	Legume hay	13
	Legume hay	8	Oats and corn	8
	Shelled corn	8		
	Linseed meal	.5		
Fattening Cattle: 400-800 lbs. each	Silage	15	Legume hay	10
	Legume hay	5	Shelled corn or	
	Shelled corn or		ground barley	16
	ground barley	14	Linseed meal	2.5
	Cottonseed meal	3		
800-1000 lbs. each	Silage	20	Legume hay	10
	Stover	4	Shelled corn or	
	Shelled corn or		ground barley	18
	ground barley	15	Linseed meal	2
	Cottonseed meal	3.5		
Stockers (wintering)	Silage	35	Legume hay	10
	Straw	8	Straw	15
	Cottonseed cake	1.5		
Beef Cows (wintering)	Silage	25 to 35	Corn stover	10
	Straw	10	Legume hay	7
	Cottonseed cake	1	Corn	2
Herd Bull (wintering)	Silage	15	Corn stover	8
	Legume hay	8	Legume hay	8
	Oats and corn	4 to 6	Oats and corn	4 to 6

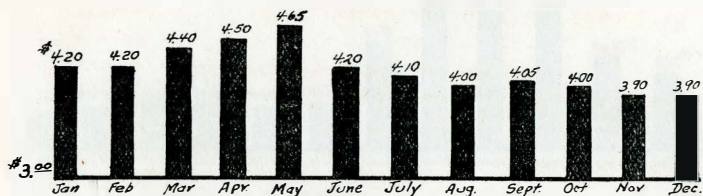
Monthly Average Prices—Chicago Market, 10-year period (1921 to 1930).



FAT STEERS - 1200 to 1500 POUNDS



FAT COWS and HEIFERS



CANNORS and CUTTERS

ers should be fattened in much the same way as steers. Cows are not so highly finished and may be fattened more largely on roughages.

Mineral Mixtures for Cattle

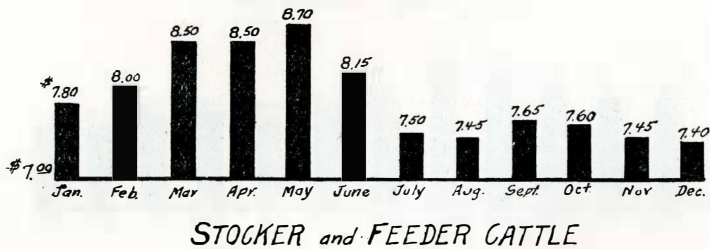
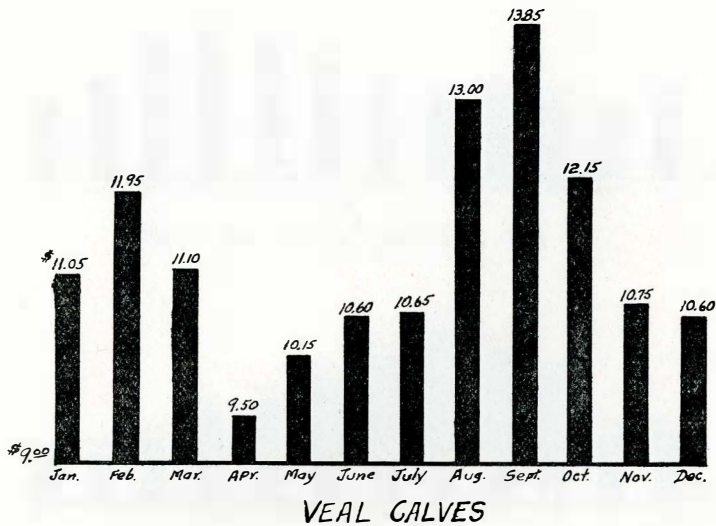
Beef cattle seldom need a mineral supplement in addition to salt especially where they have a variety of feeds. Where there is a deficiency of minerals in feeds either of the following mixtures are suggested:

No. 1. Two parts salt and one part wood ashes or ground limestone.

No. 2. Bone meal 48 pounds, ground limestone 48 pounds and iron oxide 2 pounds.

Salt should be available at all times.

**Monthly Average Prices—Chicago Market.
10-year period (1921 to 1930).**



Estimating Age of Cattle

The age of cattle may be estimated by the horns or better still by the teeth. There are four pairs of temporary incisors in the lower jaw that are later replaced by permanent teeth as follows:

- First or middle pair permanent teeth appear at 15 to 18 months.
- Second pair permanent teeth appear at 24 to 30 months.
- Third pair permanent teeth appear at 33 to 36 months.
- Fourth pair permanent teeth appear at 42 to 48 months.

Horns—

After two years growth the horns grow more slowly causing a more or less distinct ring for each years growth thereafter.

DRESSING PERCENTAGES FOR CATTLE

Class	Percent
Prime steers -----	60 - up
Good to choice fat steers -----	55 - 60
Warmed up steers -----	50 - 55
Butcher stock -----	50 - 60
Thin cattle -----	35 - 50
Veal calves (skin on) -----	65 - 70

CUTTING PERCENTAGES FOR BEEF

	Per cent of Carcass weight
Fore quarters -----	52
Hind quarters -----	48
Ribs -----	9.5
Loin -----	18
Round -----	24
Chuck -----	22
Plate -----	14.5
Flank and shank -----	9
Kidney suet -----	3
	100 100

Dairy Cattle

CHAMPION COWS OF THE DAIRY BREEDS

Breed	Cow	Pounds Milk	Pounds Fat
Holstein	Segis Pietertje Prospect	37,381.4	1158.95
	De Kol Plus Segis Dixie	33,464.7	1349.31
Jersey	Abigail of Hillside	23,677	1197.51
Guernsey	Murne Cowan	24,008	1098.2
	Anesthesia Faith of Hillstead	19,741.9	1112.5
Ayrshire	Nellie Osborne of Elmshade, 16th	27,513.6	1106.33
Milking Shorthorn	Ruth B.	21,641	956.7

What Testing the Herd Accomplishes

1. Identify and eliminate the unprofitable cow.
2. Stimulate improvement in feeding the herd.
3. Show how much to feed to obtain most profit.
4. Increase pride and interest in the care of the herd.
5. Point out and correct sources of loss in dairying.
6. Raise value of cows that are good producers.
7. Test sires through the production of their daughters.

Cow Testing Association Requirements

1. There must be 25 farmers or dairymen as members, so that the tester may visit one herd for each working day in the month.
2. In the Testing Associations now operating the cost per member is usually \$3.00 to \$4.00 per month for herds containing not more than 30 cows. The cost depends upon the salary of the tester and the distance he has to travel to visit the members each month.
3. The business of the association should be conducted through a well perfected organization with constitution and by-laws.

4. A good qualified man should be hired as a tester by the association.
5. Semi-official yearly tests may be arranged for in this connection. They are conducted on two consecutive days each month. Strictly official tests are supervised daily by an official tester and are usually of 7 or 30 days duration.
6. At times it may be advisable to test cows only once every two months. This would materially reduce the cost per member, and at the same time secure satisfactory results. Under this modified plan there should be 52 members.

**RESULTS OBTAINED IN SEVEN YEARS OF COW TESTING ASSOCIATION WORK
IN SOUTH DAKOTA**

Year ending in	1924	1925	1926	1927	1928	1929	1930
Number of Associations	5	8	7	8	8	14	12
Number of herds represented	114	170	164	173	163	320	297
Average milk production per cow	5956	6178	6363	6585	6716	7161	7714
Average fat production per cow	228	240	247	251	264	279	294
Average value of product per cow	\$98.	\$94.	\$107.	\$119.	\$122.	\$134.	\$128.
Average cost of roughage per cow	24.	25.	24.	30.	25.	25.	26.
Average cost of grain per cow	17.	15.	17.	21.	21.	24.	24.
Average feed cost per cow	41.	40.	41.	51.	46.	49.	50.
Average income over feed cost	57.	54.	66.	68.	76.	85.	78.
Feed cost to produce 100 lbs. milk	.69	.65	.64	.77	.68	.68	.65
Feed cost to produce 1 lb. fat	.18	.17	.17	.20	.17	.18	.17
Returns per dollar spent for feed	2.39	2.35	2.60	2.33	2.65	2.73	2.56
Number of cows required to net \$1,000	18	19	16	15	14	12	13

Precautions in Calf Feeding

1. Feed regularly.
2. Feed at proper temperature (100 degrees F).
3. Feed individually. Feed sweet milk.
4. Do not over-feed.
5. Make all changes gradually.
6. Give access to fresh water and salt.
7. Keep all utensils clean.
8. Provide clean pens with plenty of light and sunshine.
9. Provide plenty of bedding.
10. Keep in place where temperature does not vary too much.

Feeding Calves Skim Milk

1. Let calf have colostrum or fresh milk; take from mother not later than fifth day.
2. Feed whole milk for two weeks; gradually change to skim milk, using 10 days in making the change.
3. Start with 8 to 10 pounds and gradually increase to 12 to 16 pounds at six months.
4. Begin feeding a ground grain mixture at two weeks of age. Feed only what calf will readily clean up shortly after each feeding. Following grain mixtures are suggestive:

No. 1

Ground corn ----- 40 lbs.
Ground oats ----- 60 lbs.

No. 2

Cracked corn ----- 30 lbs.
Ground oats ----- 30 lbs.
Bran ----- 30 lbs.
Oil meal ----- 10 lbs.

5. Provide good alfalfa or clover hay at all times, good pasture when possible.

Suggested Rations for Dairy Cattle

Six Months to One Year Old—

Grain.—Same mixture as for calf feeding in proportion of one pound grain daily for first hundredweight of heifer and one-half pound for each additional hundredweight.

Roughages.—Good pasture or all leguminous hay they will eat. With roughage other than legumes add 1 part of linseed oil meal to the grain mixture.

Over One Year Old—

Corn silage with alfalfa hay makes a very good ration. With roughage other than legumes feed 2 parts ground corn, 4 parts ground oats and 1 part bran.

Cows in Milk—

1. Under most circumstances the cow should be fed all the roughage that she will eat up clean, adjusting the grain ration to the milk production. The amount of roughage daily will vary from 2 to 3 pounds per 100 pounds live weight.

2. A grain mixture should be fed in the proportion of one pound to each 3 to 4 pints or pounds of milk produced daily by the cow. Another rule is one pound of grain each day for every pound of butter fat produced during the week.

3. Feed all the cow will respond to in milk production. When she begins to put on flesh, change ration or cut down the grain.

4. When on fairly good pasture it is profitable to feed a grain mixture to the cow that produces a pound or more of butter-fat per day.

Grain Mixtures with Low Protein Roughages as Corn Silage, Corn Stover, Timothy, Prairie hay and Millet hay. Nutritive ratio of grain mixtures—1:3.9, 1:3.7, and 1:3.6.

No. 1	Pounds	No. 2	Pounds
Ground corn -----	400	Ground corn -----	200
Ground oats -----	300	Ground oats -----	200
Linseed oilmeal -----	350	Ground soybeans -----	350
		Wheat bran -----	450
No. 3		Pounds	
Ground barley -----	200		
Ground oats -----	200		
Gluten Meal -----	300		
Wheat bran -----	400		

Grain Mixtures with High Protein Roughages as Clover, Alfalfa or any Leguminous Hay. Nutritive ratio of grain mixtures 1:7, 1:6.3, and 1:5.6

No. 4	Pounds	No. 5	Pounds
Ground corn -----	100	Ground barley -----	400
Ground oats -----	400	Ground oats -----	300
Ground barley or speltz -----	100	Ground wheat -----	100
		Linseed oilmeal -----	50
No. 6		Pounds	
Ground barley -----	400		
Ground oats -----	200		
Gluten feed -----	50		
Cottonseed meal -----	50		

Grain Mixtures with Low and High Protein Roughages, as Corn Silage and Leguminous Hay or Corn Stover and Leguminous Hay. Nutritive ratio of grain mixtures—1:5.6, 1:5.5, and 1:5.3.

No. 7		No. 8	
	Pounds		Pounds
Ground corn -----	250	Ground barley -----	500
Ground oats -----	500	Ground oats -----	150
Ground barley -----	200	Gluten feed -----	200
Ground soybeans -----	150		

No. 9	
	Pounds
Ground barley -----	400
Ground oats -----	400
Wheat bran -----	100
Linseed oilmeal -----	100

Dry Cows—

Do not allow the cow to run down in condition during her dry period. When dry during the pasture season and the pasture is good, no further feed is necessary. If the cow is dry during the winter season feed her liberally of legume hay and silage. If she is a heavy milker feed her from 4 to 6 pounds of the grain mixture daily. If prairie hay constitutes the principal roughage feed her from 6 to 10 pounds grain mixture daily.

Herd Bull—

A bull in service may be fed the same grain mixture as the milking herd, 6 to 8 pounds of the mixture daily being sufficient. A large bull may need 8 pounds daily and a small bull 4 to 7 pounds daily. Feed what legume hay the bull will eat. Give the bull plenty of exercise. When not in service cut down on grain fed; if pasture is available no further feed is necessary.

COMPARISONS IN SEASONS OF FRESHENING
(South Dakota Cow Testing Ass'n Records, 1929-1930)

Season of Freshening	Number of Cows	Value of Product	Feed Cost	Income Over Feed Cost
Fall -----	922	\$135	\$53	\$82
Winter -----	876	129	51	78
Spring -----	505	125	46	79
Summer -----	311	125	50	75

The Advantages of Fall Freshening

1. Field work is at its minimum at the time that the cows require a maximum of attention.
2. Fall calves seem to thrive best.
3. Production is heaviest at a time when butterfat prices are usually at the highest point during the year.
4. Fall freshened cows have a "second freshening" when turned on pasture in the spring and are therefore more persistent producers.
5. In late summer, when field work is heaviest, when pasture and feed conditions are poorest, when flies and heat are at their worst, the cows that calve in the fall should be dry and those that calve at other times are likely to drop in production due to neglect and unfavorable environment. However, if barns are such that the cows cannot be kept in comfort in cold weather, it may be more desirable to have them calve in late winter or early spring.

Hogs

Should Hog Producers Organize?

Hogs constitute the principal source of livestock income and furnish an outlet for practically 50 per cent of the corn crop. The hog has long been known as the "mortgage-lifter" but as C. B. Denman of the Federal Farm Board expresses it, "His lifting power is no longer proportionate to his weight." Hogs that weigh from 200 to 225 pounds each when finished afford the producer the best chances for success, because of their lower cost of gain and higher market price. It takes approximately 450 pounds of feed to feed out a 100-pound feeder pig to a 200-pound finished hog while an added 500 pounds of feed are required for feeding and finishing it out as a 300-pound hog. The lighter weight finished hog yields a higher per cent of more desirable cuts and consequently commands a higher price per hundredweight.

On an average 10 per cent of our pork and 30 per cent of our lard is marketed abroad, the balance of our hog products being consumed within all sections of our own country. Hog producers have experienced years of heavy production when the entire hog crop has brought less money than in other years of lighter production. During the past 8 years the pig crop has varied from 41,000,000 to 53,000,000 annually, the small crop bringing \$300,000,000 more money than the big crop. Hog production can be readily curtailed or expanded, depending on conditions. Therefore, would it not be practical to adjust our hog production to the probable consumption? There are more than 2,000,000 hog producers in the United States. If a system of orderly production and marketing is to be worked out, it can only be done by collective action and cooperation, not by individual action and reaction.

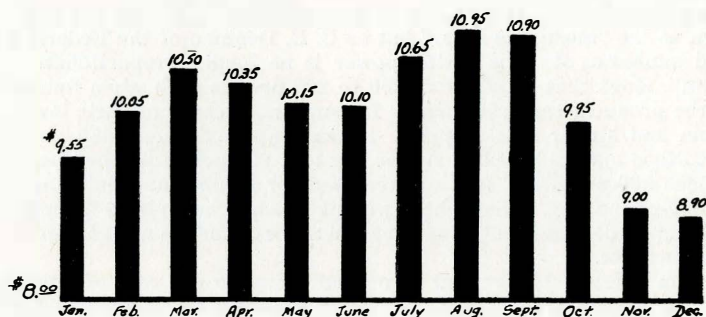
The Corn-Hog Ratio

Almost one-half of our annual corn crop is fed to hogs and frequently comparisons are made of the relative prices of corn and hogs and consequently we have the expression "the corn-hog ratio." This ratio measures the profitableness of marketing corn or feeding it to hogs. For 64 years the average price of heavy hogs at Chicago has been equal to the price of 11.6 bushels of No. 2 mixed corn at Chicago. The cost of shipping 100 pounds of live hogs from South Dakota to Chicago is less than shipping the amount of corn necessary to make this amount of live hogs which is an advantage for pork production in South Dakota. For the past 10 years South Dakota farmers have increased their hog feeding when they could buy 12.4 bushels or more of corn with 100 pounds of live hogs; and have decreased their hog feeding when 100 pounds of live hogs purchased less than 12.4 bushels of corn, hence the South Dakota corn-hog ratio is 12.4.

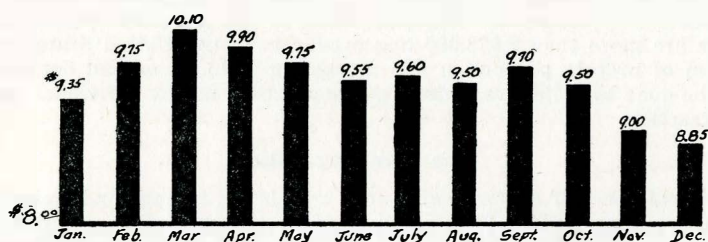
Suggestions on Hog Feeding

Good pasture for growing pigs, brood sows and all classes of hogs is very essential for low cost production. Hogs require something more than corn alone as a feed; it should be supplemented with pasture crops and rape, skim milk, tankage, feeds that supply the needed protein and minerals to provide a low cost balanced ration. Hogs usually require more minerals than other classes of livestock, because they are fed out more rapidly and fed more largely on grains. The results of a number of experiments conducted by our Agricultural Experiment Stations in the corn belt show

**Monthly Average Prices—Chicago Market,
10-year period (1921 to 1930).**



LIGHT FAT HOGS



HEAVY FAT HOGS

that when pigs are pastured on clover, alfalfa, rape or young tender blue grass, they make more rapid and more economical gains than pigs fed on the same ration in the dry-lot.

In feeding hogs for market the self-feeder is a valuable part of the equipment. Through its use the hogs consume feed more rapidly and make larger daily gains; there is a saving in the amount of feed required; the hogs reach a marketable size at an earlier age and it saves labor in feeding.

Brood Sow—

Two weeks prior to the breeding season the sows should be started on a balanced ration that they may be gaining in weight at breeding time. A protein supplement should be used along with the corn; the sows might well have access to a self-feeder mixture consisting of 50 pounds tankage,

25 pounds linseed meal and 25 pounds alfalfa hay to supplement the corn. During pregnancy the sows and gilts should each make a normal gain of 75 to 100 pounds so naturally the best means of judging how much feed is required is by the amount the hogs are gaining. Brood sows should daily receive from 1 to 1½ pounds of grain per hundredweight, while bred gilts may require 1½ times this proportion of grain.

For 3 or 4 days before farrowing, the sow's feed should be reduced and for the first 24 hours after farrowing she should have nothing but warm water. For the next 3 or 4 days following, the feeding should be light, the sow not getting back on full feed again for a week's time. When suckling pigs, the sow may need 1½ to 2½ pounds of grain per hundredweight daily.

The Boar—

The boar should be in fair flesh and have sufficient exercise. During the breeding season, the boar should have some laxative feeds and a greater proportion of protein feeds. The grain fed may consist of equal parts shelled corn and ground oats, supplemented with skim milk, tankage, alfalfa hay or the tankage-linseed meal-alfalfa mixture. Feed from 1 to 1½ pounds grain per hundredweight daily during the breeding season.

The Litter—

When the pigs are 3 to 4 weeks old a creep should be provided permitting them to have access to shelled corn in a trough. When pigs are 6 weeks old middlings or tankage might also be provided. The litter is usually weaned when 10 to 12 weeks old; the pigs kept for breeding purposes should be fed to develop bone and muscle and plenty of stretch, while those to be fattened for market are usually grown out and finished at from 200 to 250 pounds to the head. The pigs to be fattened are allowed more grain than those intended for breeders. Shelled corn, ground barley or wheat (prices permitting) self fed plus the tankage-linseed meal-alfalfa supplement also self fed make a cheap and satisfactory ration for fattening hogs.

Comparative Value of Grains as Hog Feeds

Based upon results of feeding work conducted by the South Dakota Experiment Station, it is shown that with corn prices per bushel as indicated in the first column, the other grains (ground) are economical feeds for hogs when costing the same or below the figures indicated on the same line. For example with corn costing 50 cents per bushel, wheat would be a profitable feed if costing 51 cents or less per bushel and barley would be profitable costing 39 cents or less per bushel.

Corn per bu.	Wheat per bu.	Barley per bu.	Oats per bu.	Rye per bu.	Emmer per bu.
\$.80	\$.82	\$.62	\$.36	\$.72	\$.46
.70	.71	.54	.32	.63	.40
.60	.60	.46	.28	.54	.34
.50	.51	.39	.23	.45	.28
.40	.40	.32	.19	.36	.22

The results in feeding rye as the only grain have not been satisfactory, but when it has been mixed with other grains better results have been secured.

COMPARATIVE VALUE OF SKIM MILK AND OTHER SUPPLEMENTS TO GRAIN FOR HOG FEEDING

When 100 lbs. Tankage Costs	100 lbs. Skim Milk is Worth	When 100 lbs. Middlings Cost	100 lbs. Skim Milk is Worth	When 100 lbs. Oil Meal Costs	100 lbs. Skim Milk is Worth	When 100 lbs. Soy Bean Meal Costs	100 lbs. Skim Milk is Worth
\$2.00	\$.22	\$1.00	\$.27	\$1.50	\$.16	\$2.00	\$.19
2.25	.25	1.25	.33	1.75	.19	2.25	.21
2.50	.28	1.50	.40	2.00	.21	2.50	.23
2.75	.31	1.75	.47	2.25	.24	2.75	.26
3.00	.33	2.00	.54	2.50	.27	3.00	.28
3.25	.36	2.25	.61	2.75	.29	3.25	.30
3.50	.39	2.50	.67	3.00	.32	3.50	.32

Michigan Agricultural Experiment Station Bulletin No. 92

TIME REQUIRED FOR HOGGING-DOWN CORN

Number of Pigs Av. Wt. 125 lbs.	Days Required Per Acre-Corn Yielding			
	40 bu.	50 bu.	60 bu.	70 bu.
20 pigs will require	15 days	19 days	23 days	27 days
40 pigs will require	8 days	9 days	11 days	14 days
60 pigs will require	5 days	6 days	8 days	9 days
80 pigs will require	4 days	5 days	6 days	7 days

COMPARATIVE VALUE OF SUPPLEMENTS IN HOGGING-DOWN CORN (1909-11)

Supplement, if any, to Standing Corn "Hogged Down"	Initial Weight of Shotes (pounds)	Hog Gain Accredited to the acre (pounds)	Cost Per 100 lbs. Pork
Corn, alone -----	69	357.2	3.14
Rape and pumpkins -----	92	651.7	1.86
Meat meal 10% -----	69	795.0	2.43
Soybeans -----	81	535.7	2.73
Canadian fieldpeas -----	50	333.8	4.42
Rye, green and meat meal 10% -----	69	789.6	2.69

Cost of growing corn to maturity was \$11.15 per acre.

Ia. Exp. Sta. Bul. 143

COMPARATIVE VAULE OF HOG FEEDS

	Pounds of Pork Produced Per Bushel of Corn
Corn alone -----	10.
Corn and shorts (2 to 1) -----	12.
Corn and blue grass -----	12.5
Corn and tankage (10%) -----	14.
Corn and soy beans (7 to 1) -----	14.
Corn and clover -----	14.
Corn and milk (1 to 3) -----	17.4

HOG MINERAL

Ground limestone -----	39 lbs.
Steamed bone meal -----	39 lbs.
Common salt -----	20 lbs.
Iron oxide -----	2 lbs.
Potassium iodide -----	1 oz.
Copper sulphate -----	½ oz.

(Mix these ingredients and keep constantly
before the hogs)

DRESSING PERCENTAGES FOR HOGS

Heavy butchers -----	280 - 400 lbs. 80-84%
Medium butchers -----	200 - 280 lbs. 78-80%
Light butchers -----	180 - 220 lbs. 77-79%
Heavy packing -----	300 - 500 lbs. 81-83%
Medium packing -----	250 - 300 lbs. 79-80%
Light packing -----	200 - 280 lbs. 77-78%
Bacon hogs -----	160 - 220 lbs. 76-77%
Light mixed -----	150 - 220 lbs. 75-76%
Extra light -----	125 - 150 lbs. 74-75%

Figures on hogs by Wilson and Co.

CUTTING PERCENTAGES FOR PORK

	Approximate Per cent of Carcass Weight
Loin (chops) -----	14
Shoulder (with shoulder butt removed) -----	11
Shoulder butt -----	6
Spareribs -----	3
Ham -----	19
Bacon pieces -----	15
Lard fat -----	15
Neck bone, feet, etc. -----	4
Trimnings -----	13
	<hr/> 100

Sheep

Cycles in sheep production are caused by years of profits and losses. These cycles have been fairly regular, 5 of them having occurred since 1880. They have ordinarily ranged from 7 to 10 years in length, there being from 3½ to 5 years of increased production that has been followed by a similar period of decreased production.

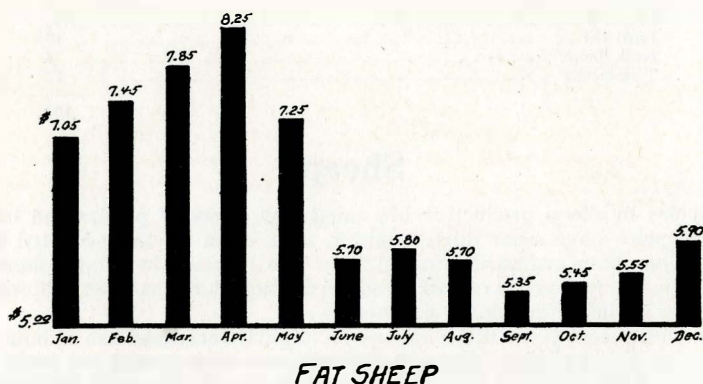
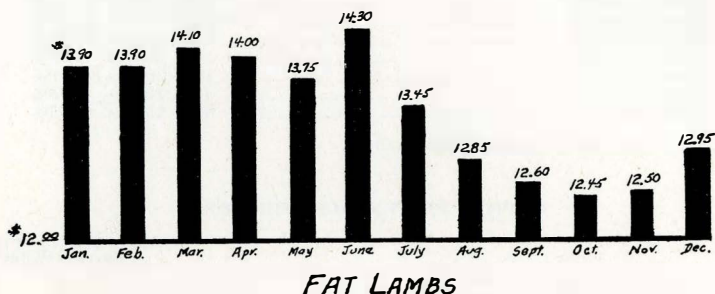
During recent years there has been a slightly increased use of lamb and mutton in the American diet, but a much more widespread use could still be made. Farmers who dress and cure their own meat might well include lamb and mutton in their diet. The proper handling of the animal prior to slaughter and a quick and careful dressing of the carcass will do much to popularize the meat with the members of the farm family.

Docking and Castrating Lambs

"Dock or be docked" is a slogan that all eastern South Dakota sheep producers might well adopt.

Lambs that are docked always have a blockier and cleaner appearance than lambs with long tails and consequently are more attractive to the buyers. Docking also aids in the prevention of maggots. The docking can well be done when lambs are 1 to 2 weeks old, using a sharp knife in cutting off the tail so as to leave a stump 1 to 1½ inches in length. If the lamb bleeds noticeably, apply a hot iron to the bleeding spot. Male lambs to be sold for feeding purposes or as fat lambs should always be castrated. Buck lambs are discriminated against on the terminal livestock markets, both as feeders and killers, usually selling for \$1.00 per hundred weight less than wether lambs of similar quality and condition. Buck lambs, not intended for breeding, should be castrated when from 7 to 10 days old.

**Monthly Average Prices—Chicago Market.
10-year period (1921 to 1930).**



Feeding Sheep

In successfully working out one's sheep feeding problems, it is important to keep in mind that the care and management which sheep receive is practically as important as the feed consumed. The feeds should be clean and free from mold and the sheep should have access to clean water and what salt they need. Regular feeding and gentle and quiet handling are important. In the summer where pastures do not afford an extensive range, frequent changes of pasture are necessary to insure freedom from stomach worms. Timothy hay or the bearded grain hays should be avoided.

Breeding ewes should be gaining in weight prior to the breeding season as this tends to increase the lamb crop through the increase in proportion of twin lambs. During pregnancy they should put on a gain of 15 to 30 pounds each. Legume hay, corn fodder and straw are economical winter feeds for ewes, especially when $\frac{1}{2}$ pound of grain per head daily is added with the roughage. Where ewes are in fair flesh in the fall, oats may well constitute the bulk of the grain, but if ewes are thin corn or barley should constitute the larger part of the grain feed. Too heavy gaining just prior to lambing time may cause udder trouble and right after lambing the ewes should be fed lightly at first, not getting onto full feed again until the third or fourth day.

When the lambs are two weeks old they should have a creep where they may get what grain and good alfalfa hay they need, the feeds so fed in troughs that the lambs cannot get their feet in it. Lambs that are put into the feed lot off pastures should be fed grain gradually so as to prevent scouring or other digestive troubles.

A Few Rations for Sheep

Breeding Ewes—

No. 1		Pounds	No. 2		Pounds
Grain	-----	$\frac{1}{2}$	Grain	-----	$\frac{1}{2}$
Corn silage	-----	2	Legume hay	-----	3 $\frac{1}{2}$
Legume hay	-----	2			
		No. 3			Pounds
Alfalfa or Clover hay	-----	$3\frac{1}{2}$			

Rams—

Where rams are on good pasture it is not customary to feed grain except a few weeks prior to and during the breeding season. Each ram should then, receive from $\frac{1}{2}$ to $1\frac{1}{2}$ pounds grain daily.

Fattening Lambs—

In lambing off corn 12 to 15 head of feeder lambs will clean up an acre of corn, the lambs individually gaining from 8 to 10 pounds each month. Where corn is being lambed-off the lambs should be given a protein supplement; if the feeder does not have a rape pasture, then a legume hay may be fed or feed one-eighth of a pound of linseed meal per head daily. For dry lot feeding here are two rations suggested, one with silage and the other without.

No. 1		Pounds	No. 2		Pounds
Shelled corn	-----	1.	Shelled corn or barley	-----	1.5
Linseed meal	-----	.1	Linseed meal	-----	.1
Corn silage	-----	2.	Legume hay	-----	1.5
Alfalfa or clover hay	-----	.5			

Estimating the Ages of Sheep

Incisor teeth in sheep offer a rather accurate means of determining ages. There are four pairs of temporary incisors in the lower jaw that are later replaced by permanent incisors, their appearance being an indication as to age. They appear as follows:

First of middle pair permanent teeth appear at 12 months.

Second pair permanent teeth appear at 24 to 27 months.

Third pair permanent teeth appear at 33 to 37 months.

Fourth pair permanent teeth appear at 48 months.

At from 5 to 7 years loose and missing teeth (broken mouth) may be seen and after 7 years most of the teeth will be gone (gummers).

MARKET CLASSIFICATION OF WOOL

U. S. Official	Old Grade	Length of Fibre	
		Combing	Clothing
64's-70's-80's	Fine	Over 2 inches	Under $1\frac{1}{4}$ inches
58's-60's	$\frac{1}{2}$ blood	Over $2\frac{1}{4}$ inches	Under $1\frac{1}{4}$ inches
56's	$\frac{3}{8}$ blood	Over $2\frac{1}{2}$ inches	Under $1\frac{1}{4}$ inches
48's-50's	$\frac{1}{2}$ blood	Over $2\frac{3}{4}$ inches	Under $1\frac{1}{2}$ inches
46's	Low $\frac{1}{4}$ blood	Over 3 inches	Under 2 inches
44's	Common		
36's-40's	Braid		

DRESSING PERCENTAGES FOR SHEEP

Fat Lambs:	
Prime	50 to 54 per cent
Good to choice	47 to 50 per cent
Common	44 to 47 per cent
Yearlings and wethers	44 to 52 per cent
Ewes, bucks and stags	42 to 48 per cent

CUTTING PERCENTAGES FOR LAMB AND MUTTON

	Approximate Per cent of Carcass Weight
Leg of Mutton	33
Loin and flank	17
Rack or Rib cut	12
Shoulder and neck	24
Breast and fore shank	14
	100

Formulas for Curing Lamb or Mutton

Be sure that the carcass has cooled out thoroughly after dressing and do not allow it to freeze. On account of the shrinkage in curing, only the larger pieces of meat should be dry-cured, the smaller ones and the rolled flank and breast being brine-cured.

Dry Cured.—For every 100 pounds of meat use 5 pounds salt, 3 pounds brown sugar and 1½ ounces saltpetre. Mix the ingredients thoroughly and rub it on the pieces of meat to be cured. They can then be packed away in a jar and the meat can be left in the pickle until used. The length of time for curing depends upon the size of the pieces; allow 1½ days per pound in the piece. If a light smoke is desired, take the pieces out of the cure when ready, brush off the salt, hang in the smoke house for 12 hours and then give a light smoke. After curing the pieces may be well wrapped and stored away until used.

Brine Cured.—For every 100 pounds of meat use 8 pounds salt, 3 pounds brown sugar, 2 ounces saltpetre and 4½ gallons water, that has been boiled. After mixing the curing ingredients thoroughly, rub each piece of meat to be cured and pack them down tightly in the jar, weight them down, dissolve balance of ingredients in the water and after cooling, pour the brine over the meat, making sure that all pieces are well covered with the brine. Allow 3 days of curing for each pound in the piece, thus a 6-pound piece will require 18 days. After curing, if a light smoking is desired, let pieces hang in smoke house to drip for 24 hours before smoking. When cured or smoked the pieces may be well wrapped and stored in a dry, dark, cool place free from vermin.

Corned.—For every 100 pounds of meat use 8 pounds salt, 4 pounds brown sugar, 4 ounces saltpetre, 2 ounces baking soda and 5 gallons of water that has been boiled. Any part of the carcass may be corned. Mix the curing ingredients thoroughly and dissolve mixture in the water. When the brine is cool, rub the pieces of meat with salt, pack in a jar and cover them with the brine solution. After being in brine two weeks, one can begin using them; if left in the brine three weeks, the pieces may have to be parboiled before using.

Dried.—In drying lamb or mutton use the same pieces as for corning, curing them in the same brine as for corned mutton, allowing 3 days cure to each pound in the piece. When cured they should be removed from the brine, allowed to drip for 24 hours and given a light smoke. After that hang them in a warm place to dry.

In the arid sections of the State they may be dried in the open air without curing, making sure that flies and vermin cannot get to the meat.

Horses

Will Horse Production be Profitable

Statistics have shown a regularly decreasing horse production in the United States and many of our leading horsemen feel that we are at the bottom of the production cycle and that in another 10 years prices of good horses will be very high. Wayne Dinsmore of the Horse Association of America states that for every 1000 horses there are 66 colts required annually for replacement purposes only, without bringing about an increase or decrease in the total number of horses and 55 mule colts for every 1000 mules are needed for replacement purposes. Our government statistics show the following relative production.

Out of each 1000 horses or mules listed in the census, the number of colts raised annually was:

Year	Horse Colts	Mule Colts
1900 -----	79	79
1910 -----	87	74
1920 -----	60	71
1925 -----	33	32
1930 -----	35	24

Such figures point to a developing scarcity of horses and mules which should bring about an increasing trend in prices. More than half the horses and three-fifths of the mules are now over 10 years of age. Farmers who are keeping good sound brood mares and breeding them to sound, typey, draft stallions should be able to realize a double profit from their work stock.

Horse Sense

1. Two lines of profit are obtained in using good brood mares for farm work and for raising colts.
2. Do not trim the mane or tail if sometime you intend to sell the horse; this trimming or roaching makes the horse "second hand" in the eyes of the buyer.
3. Keep the horses' feet trimmed.
4. Be careful not to strike a horse over the head.
5. Unsightly collar and harness galls and sores are most generally caused from badly fitted collars, hames and harness. Avoid them.
6. Mares that are heavy in foal should not be used in backing loads.
7. Be sure that mares in foal get plenty of exercise.
8. Paint the new born colt's naval with iodine; if it does not heal properly, call a veterinarian.

9. Do not permit a colt to suck a hot and sweaty mare coming in from work; milk her out first.
10. Do not lose your temper handling horses; be kind; yet firm.

Low Cost Horse Labor

Under present conditions in South Dakota farmers can effectively carry their work horses at an annual feed cost of \$40.00 or less; add to this an annual expense of \$20.00 for shelter, shoeing, harness and other miscellaneous items, making a total cost of \$60.00 for the year. On a number of our well managed farms work horses and mules are used about 1000 hours yearly, making the per hour cost per horse 6 cents or less or 60 cents per 10-hour day. A six horse team would cost \$3.60 or less per day, while daily they will plow 6 acres, or disc 30 acres or harrow 60 acres. There are definite practical ways in which this cost of horse labor may be kept at a minimum, such as:

1. Using larger team hitches and working units so that one man can tend a greater number of acres.
2. Plan your system of cropping so as to distribute the horse labor as uniformly as possible throughout the year.
3. Use home grown feeds of good quality and feed them according to the individuality of the horse and the work performed.
4. Raise some good colts each year; begin working them when they are three years old and as they develop and replace your other horses, sell the latter when 6 or 7 years old.

Practical Suggestions in Horse Feeding

1. Don't feed dusty grain or hay.
2. A horse likes variety in his feed. Oats is one of the best grains for horses; corn and crushed or soaked barley are also desirable; wheat bran is valuable for mixing with other feeds on account of its laxative effect. Timothy hay and prairie hay are the most popular roughages as they are quite free from dust. Pasture is important for horses but those at work should be fed grain and hay in addition.
3. A horse should have about 2 ounces of salt daily, fed separately from the feed.
4. It is dangerous to allow a horse, while warm, to drink too freely but a moderate drink, slowly taken, will not be harmful. Horses may be watered before, after or during feeding without affecting their digestion, but whatever system is practiced it should be regularly adhered to.
5. The amount of feed required will depend upon the work done and the individuality of the horse. In general a horse at moderate work requires 1 pound grain and from 1 to 1½ pounds hay per 100 pounds live weight, while at hard work, it requires from 1 to 1½ pounds grain and 1 to 1½ pounds hay per 100 pounds live weight. As the work increases hay is decreased and grain is increased; as the work decreases hay is increased and grain decreased.
6. In feeding the daily ration, the morning and noon feeds should each consist of three-eighths the grain and ¼ the hay, and the night feed ¼ the grain and ½ the hay.
7. A few days before foaling the brood mare's grain allowance should be decreased and laxative feeds such as wheat bran or linseed meal should be added. A light feed of bran is good for the first meal after foaling

- and the ration for several days should be light.
8. Get the colt to eating grain as soon as possible.

RATIONS FOR HORSES

	Grain	Roughage
Colt (at weaning time) 5 to 6 months old -----	2 lbs. oats	Hay
Colt (one year old) -----	4 lbs. oats	Hay
Horse (two-year old) -----	6 lbs. oats	Hay

Rations for 1,000 lb. Horse

Type of Work	Grain	Roughage
Maintenance for Idle Horse	5 lbs. ear corn	3 lbs. alfalfa hay
		9 lbs. corn stover
	4 lbs. oats or rolled barley	4 lbs. clover hay
Very Light Work		10 lbs. oats straw
		4 lbs. alfalfa hay
		14 lbs. corn fodder
	10 lbs. ear corn	5 lbs. alfalfa hay
	8 lbs. oats	5 lbs. timothy hay
Moderate Work	8 lbs. rolled barley	4 lbs. alfalfa hay
		6 lbs. timothy hay
		4 lbs. alfalfa hay
		5 lbs. prairie hay
	13 lbs. ear corn	6 lbs. alfalfa hay
Hard Work	12 lbs. oats 1½ lbs. bran	7 lbs. timothy hay
	10 lbs. rolled barley	11 lbs. timothy hay
		6 lbs. alfalfa hay
		5 lbs. prairie hay
	12 lbs. shelled corn	12 lbs alfalfa hay
	2 lbs. bran	4 lbs. corn stover
	12 lbs. oats	8 lbs. timothy hay
	2 lbs. bran	5 lbs. clover hay
	10 lbs. rolled barley	8 lbs. alfalfa hay
	2 lbs. gluten meal	6 lbs. prairie hay

Estimating Ages of Horses

A horse's age may be quite accurately determined by an examination of the teeth. There are three indicators of age, first the eruption of the teeth, second the "cups" or "tables" on the wearing surfaces, and third the form and relative position of the teeth. In the horse the eruption of the incisor teeth is as follows:

Location of Teeth	Temporary or Colt Teeth Come in at	Permanent or Horse Teeth Come in at	Permanent Teeth Are up in Wear at
First pair middle incisors or nippers	Birth or First Two Weeks	2½ to 3 years	3 years
Second pair or intermedi- ates (located on either side of the nippers)	4 to 8 Weeks of Age	3½ to 4 years	4 years
Third pair or corner in- cisors	7 to 9 Months	4½ to 5 years	5 years

As the teeth wear down the "cups" disappear in quite regular order, hence the following suggestions as to age:

Lower Jaw	Cups Leave at	Upper Jaw	Cups Leave at
Middle or nipper pair -----	5½ - 6 years	Middle Pair -----	9 to 10 years
Intermediate or next pair ---	6½ - 7 years	Intermediate pair -----	10 to 11 years
Corner pair -----	7½ - 8 years	Corner pair -----	11 to 12 years

In older horses it becomes more difficult to estimate the age. The direction of the teeth becomes more slanting and their triangular wearing surface changes to a rounded form.

Common Ailments, Diseases and Parasites of Livestock

A Suggested Farmer's Medicine Case

Whenever an animal becomes suddenly and seriously ill, no time should be lost in securing a veterinarian. Many of the simple ailments are more readily recognized and yield to simple remedies. Whenever an ailment that appears simple does not show a change within a short time, a veterinarian should be called. It is well for every farmer and stockman to have a few medicines on hand for emergencies, hence this suggested list:

Blue vitriol (copper sulphate)	2 pounds
Carbolic acid	½ pint
Castor oil	½ pint
Compound solution of cresol	1 gallon
Epsom salts	5 pounds
Formalin	1 pint
Linseed oil (raw)	2 quarts
Potassium permanganate	¼ pound
Sodium fluorid (talculated)	1 pound
Tincture of iodine	4 ounces
Turpentine	1 quart
White lotion	1 pint
White liniment (modified)	½ pint
Drying or healing powder or ointment.	

Instruments and Dressings

Absorbent cotton, 1 pound.
Bandages, 4 two inches wide, 5 yards long; and 2 one inch wide, 5 yards long.
Clinical thermometer, at least two.
Dressing forceps.
Graduate for measuring liquids.
Hoof knife.
Milk tube.
Soap, germicidal.
Surgeon's knife for castrating.
Syringes—
 Hypodermic, 10 cc.
 Metal dose.
 Rubber syringe, long nozzle.
Trocár.
Twist.

Common Medicines and their Actions

Blue Vitriol (copper sulphate).—An antiseptic astringent and mild caustic. Used to burn out proud flesh by dusting it on affected part every two or three days, depending upon how it burns. Also used for foot rot.

Castor Oil.—Useful physic for colts, calves and hogs. Dose for mature hog, 2 oz.; colts 2 to 4 oz.; calves 1 to 2 oz.

Epsom Salts.—A good physic especially for ruminants. Dose for mature animals—Cow 1 to 1½ lbs.; sheep 2 to 4 oz.; hog 1 to 2 oz.

Linseed Oil (raw).—A mild physic or laxative. Dose for mature horse 1 to 2 pints.

Potassium permanganate.—Good disinfectant used in drinking water for poultry, the proportion being 1 gallon of water to as much permanganate as will remain on a dime.

Sodium Fluorid (talcated).—A good powder for destroying lice on poultry.

Tincture of Iodine.—Used in destroying ring worms; used externally as a sweat blister, painting part once a day until it blisters, then grease part and permit healing.

Turpentine.—Good for colic, bloating and intestinal worms, stimulates kidneys.

White Lotion.—

Sugar of lead, 1 oz.

Sulphate of zinc, 6 drachms

Water, 1 pint

Shake well before using. Extensively used for wounds, sores and scratches. Can be used three times a day.

Liniment (modified white).—

Aqua ammonia (strong), 2 oz.

Turpentine, 2 oz.

Linseed oil, 2 oz.

Shake—will blister if used freely. Can be made stronger or weaker by changing amounts of ammonia and turpentine.

Drying and Healing Powder.—

Oxide of zinc, 2 oz.

Calomel, 2 oz.

Boracic acid, 2 oz.

Air slacked lime, 2 oz.

Mix. Dust on wound. Good for galls and sores where dry dressing is desired. Can be made into an ointment by adding lard or vaseline.

Proper Carcass Disposal

The carcasses of all farm animals, no matter what the cause of death, should be disposed of in such manner that there will be no danger of spreading disease. There are two methods in common use, the first of which is much more preferable than the second.

1. Burning.—All dead farm animals should be burned. There is usually little difficulty in completely consuming the carcass if provision is made so that there is a draft of air from the bottom. The smaller animals may be placed on a metal wheel supported on several bricks, wheel acting as a grate allowing burning without hindrance. Larger animals may be placed over the crossing of two trenches dug at right angles; these trenches need be only a few inches deep and 6 or 8 feet long. Heavy sticks of wood or other supporting material should be placed across trenches to support carcass. It is understood that some attention must be given fire after once started otherwise projecting parts of carcass may not be consumed. It is also of utmost importance that burning be complete. No parts should remain unburned. Any kind of fuel will answer the purpose. Much success has resulted from use of kerosene where wood is not obtainable.

2. Burying.—When this is followed, the grave must be large enough so that carcass may be placed on its side. It must be deep enough so that smaller carcasses will be covered with at least 4 feet of earth; larger carcasses should have 6 feet over them. It is also advisable to cover the carcass with 3 to 6 inches of fresh lime before throwing on dirt.

Under no circumstances must carcasses be thrown into streams, ponds, old wells, ravines or other out of the way places. The practice of burying fowls and little pigs in the manure heap is to be condemned.

Directions for Securing, Packing and Sending Specimens for Examination to Animal Health Laboratory, Brookings, South Dakota

1. Select Proper Tissues.—Take those parts that show characteristic lesions. For best results these should be procured as soon after death as possible.

2. Prevent Putrefaction.—Between April 1 and December 1, all tissues intended for bacteriological examination, should be packed in a container surrounded by crushed ice. Those desired for microscopic examination should be preserved in equal parts glycerine and water or in formalin solution, 1 ounce formalin in quart of water.

3. Pack Well.—As important as securing suitable specimens. Regulations require material be packed in clean metal or glass containers about which is sufficient quantity of absorbent material to take up liquids from accidental leakage or breakage.

(1) Small samples blood may be sent in small vials, wrapped in cotton, or a few drops blood placed between two pieces of glass, allowed to dry, wrapped in cotton and mailed.

(2) Small specimens placed in bottles that are well corked and labeled, wrapped in cotton and placed in screw top mailing case or small tin or wooden box.

(3) Large specimens placed in screw top fruit jars and packed in saw dust in wooden box.

4. Shipping.—(1) Each specimen should be labeled for identification.

(2) Each package should contain name and address of person sending it.

(3) Each specimen should be accompanied by separate letter giving history of disease symptoms, post mortem evidences, animals lost or sick, number infected and any other available information.

5. Remember.—(1) Stomach contents and other fluids suspected to contain chemical poisons should be sent to the Department of Chemistry, State college.

(2) Feeds suspected to contain poisonous plants, moulds or other material of vegetable origin should be sent to the Department of Botany, State college.

A Fly Spray

A good fly spray for cattle may be made by dissolving one-half pound of fish oil soap in soft water, bringing the mixture to the boiling point. Then stir this soap solution into two gallons of crude oil, mixing it thoroughly. When used for spraying, mix one quart of this solution and one teaspoon of "Black Leaf 40" with one gallon of water.

Whitewash Formulas

1. Half a bushel of unslacked lime. Slake with warm water; cover it during the process to keep the steam. Strain the liquid through a fine sieve strainer. Add a peck of salt previously well dissolved in warm water; three pounds of ground rice boiled to a thin paste and stir in boiling hot; half a pound of powdered Spanish whiting, and a pound of glue which has been previously dissolved over a slow fire. Add five gallons of hot water to the mixture, stir well and let it stand for a few days; cover up to protect from dirt. It should be put on hot. Coloring matter may be put in to make it of any shade—spanish brown, yellow ochre, or common clay, etc.

It is well to always strain before using in order to prevent any gritty substance from getting into the valves of the sprayer and interfering with

its proper operation. With whitewash thin and smooth, no difficulty will be experienced.

2. Slake fresh quicklime in water, and thin it to a paste or paint with skim milk. The addition of 2 or 3 handfuls of salt to a pail of the wash is beneficial. The addition of 3 ounces of chloride of lime to the gallon of whitewash makes an excellent disinfectant.

Common Ailments, Diseases and Parasites of Cattle

Abortion Disease.—This is an infectious disease of cattle and hogs characterized by premature births and prevented to a very large extent by sanitary measures. The germ that causes the disease is just a little different in cattle than it is in hogs; it is known as *Bang bacillus*. When an animal is affected with this disease the germs are thrown off through all excretions, but especially in the dead calf and after-birth.

The main symptom is the premature birth of the calf. Most abortions occur between the fifth and seventh month of pregnancy. Retained after-birth is also characteristic of the disease and some diseased cows may fail to breed.

Treatment is largely a sanitary problem. The absolute isolation of infected animals and extreme sanitary precautions are essential. The proper disposal of aborted calves and afterbirth including all solid bedding, is important. There is no vaccine on the market that has any great value. Cattle may be tested by the blood test in order to find out definitely as to whether the disease is present.

Anthrax.—An acute and infectious disease of most animals. The animals are susceptible in the order named; cattle, sheep, horses, man, hogs, dogs, cats, and poultry. The disease is caused by the anthrax bacillus. This germ is very resistant to weather conditions and has the power of forming a spore. A spore may live in the soil for as long as twenty years. The germs may be killed by heat and disinfectants.

There are various types of anthrax. Some cases die very quickly, others linger along and some few animals recover. A definite diagnosis is made by post-mortem examination and an examination of the blood through the use of a microscope. On post-mortem the blood will show little tendency to clot. The spleen is usually enlarged and its pulp is soft.

Any treatment given to the sick animal is of little help. However, large doses of anthrax serum have been known to pull animals through. All cattle, sheep and horses on the infected premises should be vaccinated. A warning is issued against handling or skinning carcasses because the disease is infectious to man.

Blackleg.—An infectious disease caused by the blackleg germ, common in calves, ends in death. The germ that causes this disease is quite resistant and will stay in the soil for eight or ten years. It is not a disease of the blood, but of the heavy muscles.

The symptoms are a high temperature, lameness, swellings on portions of the body. The swellings that develop are filled with gas. Most animals so affected die within thirty-six hours. The disease is common in calves from six to eighteen months old especially when they are in good condition.

There is no treatment for the sick animal. The vaccine against blackleg is probably the most perfect vaccine in veterinary medicine. Blackleg ag-gressin is the most popular vaccine at the present time and will generally protect an animal for at least a year. On farms where blackleg is common all calves should be vaccinated at the age of six months.

Bloat.—This condition is due to the formation of large quantities of gas in the stomach. It is caused by feeding wet clover or alfalfa especially pasture. Alfalfa hay may cause it when animals are not accustomed to the hay.

The symptoms of the disease are distention of the abdomen, particularly, in the upper left portion. When tapped with the finger there is a drum-like sound. There is difficult breathing and extreme distress.

In mild cases the first treatment may consist of exercise and the placing of a bit in the animal's mouth. A drench consisting of three table-spoons of forty per cent formaldehyde in a quart of water may be given. In an emergency case it may be necessary to tap the animal with a trocar. This trocar should be cleaned and sterile. The trocar is plunged into the left flank in the middle of the triangle in front of the left hip bone. The point should be directed inward, downward and forward. The stylus should be removed and the cannula left in position for several hours or longer if necessary.

Cornstalk Disease.—This is a disease common in the fall of the year, especially among cattle. The exact cause of cornstalk disease has never been definitely determined, but it is evidently some form of poison. It may possibly be prussic acid or potassium nitrate or both. The symptoms are a quick sickness, distress, crazy actions and usually death. Especially common in the fall of the year. The treatment of the sick animal is rather hopeless. Cornstalk disease may be entirely prevented by keeping cattle and horses out of the cornstalks.

Garget.—This disease may be caused by injury, exposure or in some instances by a germ. It is characterized by swelling of the udder, caked conditions, the passing of lumps of pus in the milk and in the last stages a sloughing of the quarter. The cow should be placed in a stall with plenty of dry bedding. Bathe the udder four or five times a day in hot water as hot as the hand can stand. Dry with a flannel cloth and apply a salve made of three parts of lard and one part of turpentine. The udder should be milked out every hour in the day if possible.

Hemorrhagic Septicemia.—This is an acute or sub-acute infectious disease caused by a variety of germs. It is especially common in the fall and winter months. Symptoms consist of a fever, swellings over the body, constipation at first and later a bloody diarrhea. On post-mortem many internal hemorrhages are found among the organs. The treatment consists of putting the animals in a comfortable place, free from drafts and changing the feed. All cattle should be vaccinated with aggrassin when this disease breaks out in the herd.

Lice.—Treatment consists of dipping the animals on a warm day in three per cent creolin solution and repeat in ten days. In the winter when dipping is not possible a powder made of equal parts of flowers of sulphur and ground sabadilla seed may be dusted on the animal. The stalls in the stable should be thoroughly cleaned and sprayed with creolin solution.

Lumpy Jaw.—This chronic infectious disease in cattle is caused by a low form of plant life called ray fungus. This disease occurs in various forms. A common form is the cold abscess that develops on the skin over the jaw or on the neck. These abscesses are loose and not attached to the bone. Another form affects the lower jaw causing a large hard swelling. Also an internal form may affect the tongue, lungs and liver. The treatment for this disease is both medicinal and surgical, therefore, a veterinarian should be called for the treatment of this disease. An animal so af-

fectured should not be allowed to run in the pasture that may be used the following year for other animals.

Milk Fever.—This disease occurs usually shortly after freshening, chiefly in matured cows. The cow becomes unconscious, may have convulsions and finally becomes paralyzed. A peculiar position that she takes when lying down is quite characteristic with the head pointing to the flank. A veterinarian should be called immediately for treatment. In case it is not possible to secure a veterinarian the udder should be inflated through a milk tube which has been previously boiled. The introduction of air pressure in the udder is almost a specific for this disease.

Pink Eye.—This disease is an influenza of cattle characterized by a fever, frequently difficult breathing, inflammation of the eyes, running of the nose and in some cases a diarrhea. The eyes become so inflamed that the animals frequently go blind temporarily. An animal so affected should be put in a dark room entirely away from the rest of the herd. The eyes should be washed with a weak solution of boric acid. The nose and face should be kept clean by the use of antiseptic solutions. If the animal is kept in a comfortable place, given plenty of water to drink and on a light diet it will usually recover.

Ringworm.—A common condition in calves caused by a vegetable parasite. Scabby areas develop on various parts of the animal especially on the head around the eyes. The disease spreads from one animal to another by contact. Treatment consists of softening the scabby areas by the use of vaseline or some other salve and then applying tincture of iodine straight. This disease is contagious to people and a person handling such cases should be very careful to use gloves and not touch his own face.

Cattle Scab.—A disease caused by a minute parasite which burrows into the skin. The symptoms are the presence of small raised patches on the skin which itch intensely. Later there is an exudation of serum which dries and forms a scab. A definite diagnosis may be made by taking scrapings from these sores and sending into the laboratory for identification. All cases of cattle scab should be reported to the State Department of Agriculture. It is necessary to dip the cattle at least twice in lime and sulphur dip in order to control this disease.

Tuberculosis.—This is an infectious disease caused by the bovine tuberculosis bacillus. The disease is spread through contaminated feed. The germs are thrown off from the infected animal in all excretions. It is rarely possible to diagnose tuberculosis in the living animal without some form of test. The symptoms are not evident enough except in the last stages of the disease. The proper method of finding out whether an animal is affected or not is by having the animal tested by a veterinarian.

There is no treatment for this disease and all animals so affected should be slaughtered. A veterinarian should be secured to test the animals and all reacting animals should be destroyed. Any cattle owner may make application to the State Department of Agriculture at Pierre for the accredited herd test. Details of this system may be secured by writing to the State College at Brookings or to the State Department of Agriculture.

White Scours.—This is an acute infectious disease affecting calves and is due to several kinds of germs, but especially the colon bacillus. The symptoms are evident from the name. In a few days after the calves are born they develop a persistent diarrhea, some become weak and not many cases recover. Treatment is largely preventive through cleaned and disinfected quarters. A veterinarian should be called. Calves may be vaccinated against this disease at the time they are born.

Common Ailments, Diseases and Parasites of Hogs

Hog Cholera.—A disease of hogs caused by a filterable virus, characterized by a high fever, loss of appetite and usually death. The virus that causes this disease has certain characteristics which are important in the control of hog cholera. The virus is easily killed by sunlight, by use of disinfectants and also by heat. If the virus is kept away from sunlight and air it will live from one year to another, therefore, it is important in the control of hog cholera to thoroughly clean and disinfect the hog houses and lots and let in plenty of sunlight and burn all dead animals.

Hog cholera occurs in three different types, mainly; a very severe type, the acute type and the chronic type. The acute type is the most common form known. The first symptom is a fever then a loss of appetite. At first the animal is constipated, but later has a diarrhea. Red spots may develop on the skin. The animal becomes weak and has a wobbly gait. Such an animal usually lives six or eight days and then dies.

Treatment for hog cholera is largely a preventive proposition. Hog cholera may be prevented by quarantine, sanitation and vaccination. A sick hog should be immediately isolated. A quarantine should be placed on the farm, at least a voluntary quarantine if not a civil quarantine. All dead hogs should be burned. The premises should be thoroughly cleaned and disinfected. All well hogs should be vaccinated. Vaccinating is best done by a veterinarian.

Hog Flu.—An infectious disease of swine of which the cause is not definitely known. The symptoms are a high fever, loss of appetite, a rapid loss of flesh and a very intense cough. There is an intense inflammation of the wind-pipe and lungs. There is a frequent complication of pneumonia. If pneumonia does not occur, a very large percentage of the hogs will recover. The disease is common in hogs that are shipped a long distance and also in hogs that run in the corn field. Treatment consists of putting the hogs in a hog house which is free from drafts and providing heavy bedding. If the hogs are constipated they should receive a laxative in the form of Epsom salts. They might also be given an internal anti-septic such as a one per cent solution of copper sulphate.

Hemorrhagic Septicemia.—This disease is usually a complication of hog cholera. It is caused by a variety of germs and these germs get into action only after the animals resistance has been lowered, usually by hog cholera. The symptoms of this disease are so near the symptoms of hog cholera that even an expert has difficulty in telling the difference. A good rule to follow in this connection is to be sure that hog cholera is not present. There is a vaccination for hemorrhagic septicemia which is about fifty per cent efficient. The main thing to remember is that the hogs should be immunized against hog cholera.

Lice.—Thoroughly spray or better dip animals in three per cent creolin solution. Repeat in ten days. Thoroughly clean and disinfect the hog house, shed and pens.

Mange.—This is a parasitic disease caused by a very small mite. The mite digs holes in the skin and sets up an intense irritation. A new generation of mites hatch out every ten days. One female mite may lay 10,000 eggs. The disease spreads only by contact, that is one hog rubbing against another.

The common coal-tar dips have little or no effect on hog mange. It is necessary to use a heavy oil or a lime and sulphur dip. Crude oil is the best if it can be secured. Crank case oil may be used, but the results are

not so good as from crude oil. One pint of kerosene added to each gallon of crank case oil will improve it. Lime and sulphur may be secured from most any drug store and should be used according to directions on the container. The best method of applying oil is through a dip tank. If a dip tank is not available the dip may be sprayed on the hogs. A second application must be given in ten days as the first application does not kill the eggs.

Necrobacillosis.—This disease is caused by a variety of germs that are common in most barn lots. It occurs in several different forms commonly known as sore mouth, bull nose and "necro." The most important form is necrotic enteritis, commonly called "necro." The symptoms of necrotic enteritis are a limited loss of appetite, very little fever, but a very profuse diarrhea. The disease occurs in pigs weighing from forty to sixty pounds. It does not go through the herd as rapidly as does hog cholera. Some of the thrifty pigs may never take the disease. Some pigs may recover, but are not thrifty thereafter.

The system of management that provides for cleaned farrowing pens and a pasture not previously used for hogs for two years will prevent necrotic enteritis to a large extent. An internal antiseptic such as a one per cent solution of copper sulphate may be given to the sick pigs, the dose being one to two teaspoons of the solution per head daily. This may be given in the drinking water or slop.

White Scours.—A disease of young pigs only a few days old. It is caused by a sudden change of feed in the sow, feeding the sow too quickly after farrowing, feeding the sow too much after farrowing and in some instances, exposure of the little pigs. The symptoms of the disease are evident in the name. The treatment consists of removing the cause and giving each pig one teaspoon of castor oil.

Thumps.—A disease of young pigs which are very fat and have not received the proper amount of exercise, caused by indigestion. The main symptom is a sudden contraction of the diaphragm. It is not the heart beats or the lungs, but is a spasm of the muscles in the diaphragm. Treatment consists of giving the pigs the proper exercise and cutting down some on the feed of the sow. The little pigs should be allowed to run outside of the pens and be entirely shut away from the sow during certain hours of the day. Some owners may shut the sows outside of the hog house for awhile each day keeping the pigs in the pens giving each affected pig one teaspoon full of castor oil.

Tuberculosis.—An infectious disease of hogs caused either by the bovine or avian tuberculosis bacillus. The disease is contracted by hogs in following cattle in the feed lot, drinking skim milk from infected cows or the eating of dead hens. It is not possible to discover the symptoms because most hogs are marketed before many symptoms develop. In extreme cases the animal becomes very thin, coughs considerable and gets smaller instead of larger. There is no treatment for this disease. It may be prevented by the elimination of tuberculosis in cattle through the use of the tuberculin test and the elimination of the disease in the poultry by frequent culling of the flock.

Worms.—The most common internal parasite is the round worm. The round worm eggs are passed out of the larger hogs, left in the soil over winter, are picked up by little pigs, swallowed and absorbed into the blood stream, carried into the lungs and hatch out, coughed up into the mouth, again swallowed and develop into adult worms. Round worms may be pre-

vented by a system of management known as the "Hog Lot Sanitation" system which essentially provides for a clean farrowing place and a pasture free from worm eggs. If hogs are infested with worms they may be given a dose of medicine consisting of fifteen drops of oil of chenopodium and one ounce of castor oil.

Common Ailments, Diseases and Parasites of Sheep

Hemorrhagic Septicemia.—An infectious disease caused by germs of the same name which are common in most barn lots. Sheep that are shipped a long distance are especially susceptible. Symptoms are usually sudden death without any evidence of symptoms. In the chronic cases a diarrhea may develop. Frequently this is bloody diarrhea. All well animals should be immunized with hemorrhagic septicemia aggressin when this disease breaks out in the flock.

Paralysis of Pregnant Ewes.—A common condition in ewes that are overly fat, and under exercised. The disease is really an acidosis. The symptoms are a paralyzed condition a few days or weeks before the ewe is to give birth to lambs. The animal will lie down in a paralyzed condition and will die in two or three days. On post-mortem examination an excessive amount of fat is found and generally two lambs. The prevention of this disease consists of feeding the ewes on a balanced ration which contains a laxative feed such as alfalfa hay. In extreme cases where ewes cannot receive exercise they should be fed one pound of baking soda to each one hundred ewes once a day. If the sick ewes are constipated they should be given one-fourth of a pound of epsom salts in the form of a drench.

Internal Parasites.—The most important internal parasites that infest sheep are tape worms and stomach worms. It is not necessary to go into the life history of these worms because the control measures are practically the same for both. The symptoms of worms are diarrhea, unthriftiness and in some cases swellings of the lower jaw. Prevention lies in a frequent change of pasture or range. The most common treatment for the sick sheep is the use of a one per cent solution of copper sulphate. This solution is made by dissolving one-fourth pound of copper sulphate in three gallons of water. Depending on the size of the sheep, the dose may be from one to four ounces of the solution. It is best given by the use of a dose syringe or it may be given by the use of a small drenching bottle. On badly infested farms it may be necessary to treat the sheep once a month during the year.

Another common formula is as follows:

- ¼ pound bluestone.
- 3 ounces nicotine sulphate (Black leaf 40).
- 3 gallons water.

For lambs 2 to 6 months of age the dose is 1 to 1½ ounces or 30 to 45 cc.; lambs 6 months to 1 year use 1½ to 2 ounces or 45 to 60 cc.; for adult sheep use 2 to 3 ounces or 60 to 90 cc. Repeat the dose in 10 days and every month thereafter during the spring and summer. Avoid treating ewes within 3 weeks of lambing time. Keep food away 12 hours before treatment and 4 hours after treatment.

Ticks.—Sheep ticks occur in the wool and on the skin. They are easily seen and recognized. There is a new generation in about twenty days. The treatment for ticks is the dipping of the sheep in any common coal-tar sheep dip. They should be dipped twice at an interval of twenty-four to twenty-eight days.

Common Ailments and Diseases of the Horse

A number of the ailments as azoturia, colic and founder may be avoided by proper feeding and watering.

Feeding.—When horses are idle the grain feed should be reduced at least one-half. If idle for 3 or 4 days, the horse should be brought back gradually onto full feed. An occasional bran mash in the feed is excellent. Have blue grass pasture on which horses may be turned onto at night.

Watering.—A warm or tired horse should never be given all the water he wants to drink. A few swallows will do no harm, but cool him off first and then give him only a moderate amount of water; after having eaten his grain he can be allowed all he will drink. Very cold water is objectionable.

Colic. Cause.—Errors in feeding and watering, sudden chilling, development of gas, constipation, impactions, paralysis of bowel movement, twists in intestines and parasites.

Symptoms.—Sweating, rolling, pawing, unusual attitudes, distended abdomen.

Treatment.—Call a veterinarian and in meantime make the horse as comfortable as possible.

Prevention.—See paragraph on feeding and watering.

Distemper (strangles).—Acute congestious disease. Cause.—Due to a specific variety of pus producing bacterium.

Symptoms.—Incubation period 4 to 8 days, nasal catarrh, cough, swelling of glands in region of throat, high fever and abscesses may develop in any part of the body but commonly in throat region.

Treatment.—Call a veterinarian; sanitation is important; exposed horses should be immunized; the treatment for abscesses is operative.

Scratches. Cause.—Exposure to mud, melting snow or fumes from decomposing manure.

Symptoms.—Slight swelling and fever of legs below the knees and oozing through skin of a watery fluid which later removes the hair in small patches.

Treatment.—Keep the horse in a dry clean stall out of mud and melting snow, Remove crusts of the scabs by washing thoroughly with warm water and germicidal soap and then apply several times daily white lotion, rubbing it in thoroughly.

Sore Shoulders. Cause.—Most generally due to poorly fitting collar or bad line of draft either high or low.

Treatment.—Remove the cause; if galls are not bad wash with hot or cold salt water and apply oxide of zinc ointment; it may be necessary to give animal a rest. Clean collars daily.

Thrush. Cause.—Dirty stables, muddy roads, poor quality of horn in the feet.

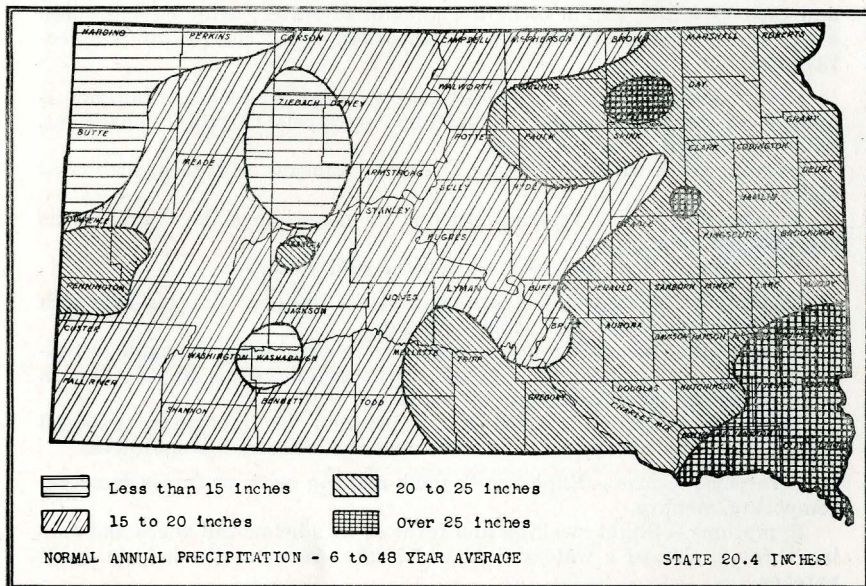
Symptoms.—Lameness, slight fever in foot, discharge of thin black pus with very offensive odor from cleft of frog.

Treatment.—Clean stable, keep horse out of mud for few days, cut away all shreds of frog, pack cleft with cotton saturated with tincture of iodine. Renew dressing daily for several days then pack with plain cotton several days more to exclude foreign matter.

Wounds or Wire Cuts.—Stop the flow of blood with ice water; cleanse wound thoroughly by irrigation rather than with a sponge or cotton; re-

move foreign matter, shreds of skin and hair. If extensive, call a veterinarian, otherwise dress daily with a mild disinfectant (2 per cent) and encourage healing from the bottom. Repel flies with fly oil or oil of pine tar placed about the edges of the wound but not in it. When healing has become well started, discontinue the liquid disinfectant using the healing powder instead.

Farm Business



TOTAL PRECIPITATION IS IMPORTANT

The greatest amount of precipitation occurs in the southeastern part of the State and diminishes toward the north and west.

(Taken from Bulletin 238, Types of Farming in South Dakota)

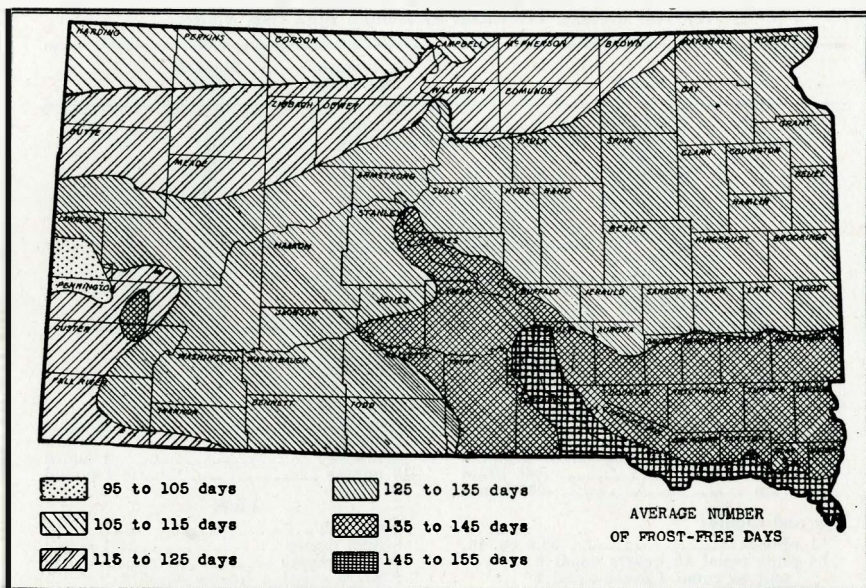
Measuring Hay in Stacks

South Dakota Method.—South Dakota's law for measuring hay in stacks applies in all cases where no special agreement for measuring was made between the contracting parties as stated in Chapter 209 of the 1915 Session Laws.

(The overthrow is the distance in linear feet and inches from the ground on one side of the stack, directly over and opposite to the ground on the other side of the stack.)

Rick Stack.—Obtain the number of cubic feet by subtracting the width from the overthrow, dividing the result by 2, multiplying this result by the width and this product by the length.

Round Stack.—Obtain the number of cubic feet by multiplying the circumference (taken at base of stack) by itself and the product by the height and divide by 25.



GROWING SEASON INFLUENCES CROPS GROWN

The period between the last killing frost in the spring and the first one in the fall largely determines the crop varieties grown in the different areas

The number of cubic feet of hay in a ton varies according to how long the stack has settled and the nature of the grass in the stack. Unless otherwise agreed upon the law specifies the following:

Nature of Hay	Cubic feet of hay in a ton	
	Settled 30 to 60 Days	Settled more than 60 Days
Clean alfalfa -----	512	422
Clean timothy and clover -----	512	422
Clean native blue joint, alkali or salt grass or wheat grass or mixed -----	422	343

Quartermaster's Method.—Add the width of the stack to the over-throw, divide by four, multiply the result obtained by itself and the product by the length, which gives the number of cubic feet in the stack. Straw: 1000 cubic feet equals 1 ton.

Measuring Hay in Mow.—Multiply the length by height by width in yards and divide by 15, if hay is well packed. If hay is shallow or rather loose in mow, divide by 18. These figures should vary from 15 to 18, depending upon the packing. The quotient will be approximately the number of tons.

CORN SHRINKAGE IN CRIBS

Ten year average. Percentage by months. Iowa Exp. Station

Month	Average Shrinkage	Monthly Rate
November -----	5.2	5.2
December -----	6.9	1.7
January -----	7.5	.6
February -----	7.8	.3
March -----	9.7	1.9
April -----	12.8	3.1
May -----	14.7	1.9
June -----	16.3	1.6
July -----	17.3	1.0
August -----	17.8	.5
September -----	18.2	.4
October -----	18.2	.0

WEIGHTS AND MEASURES

Avoirdupois: (Partial)

27 11/32 grains -----	1 dram
16 drams -----	1 ounce
16 ounces -----	1 pound
1 grain -----	.065 gram
1 gram -----	.035 ounce

Apothecaries:

20 grains -----	1 scruple
3 scruples -----	1 dram
8 drams -----	1 ounce
12 ounces -----	1 pound

Fluid

Dry and Liquid:

1 pint -----	33.6 cu. in.
64 pints equal 32 quarts equal 8	
gallons equal 4 pecks equal 1	
bushel.	
63 gallons equal 2 barrels equal	
1 hoghead.	

60 minims -----	1 fluid dram
8 fluid drams -----	1 ounce
16 fluid ounces -----	1 pint
8 pints equal 4 quarts equal 1	
gallon equal 8.35 lbs of water	
1 teaspoonful -----	1/6 ounce
1 tablespoonful -----	1/2 ounce

5,280 feet equal 1960 yards equal 880 fathoms equal 320 perch equal 8 furlongs equal 1 mile.
43,560 square feet equal 4,840 square yards equal 160 perch equal 160 square rods equal 1 acre.

METRIC EQUIVALENTS

Length:

1 inch -----	2.54 centimeters
4 inches -----	1 decimeter
1 yard -----	.9144 meter
1 rod -----	5.029 meter
1 mile -----	1609.3 meters

Bulk:

1 liquid pint -----	.473 liter
1.06 liquid quarts -----	1 liter
.9 dry quarts -----	1 liter
1 bushel -----	35.24 liters

Number of Gallons in Circular Tanks and Wells.—To find the contents in gallons of circular tanks, square the diameter in feet, multiply by the depth, and then multiply by 5.875.

Number of Gallons in Square Tanks.—To find the number of gallons in any square or oblong tank, multiply the number of cubic feet it contains by 7.4805.

Board Measure.—The unit of measure is the board foot, which is a board one inch thick and one foot square. Lumber is always sold on the basis of 1000 feet board measure (B. M.).

Formula.—To find B. M. multiply the length in feet by the width and thickness in inches and divide the product by 12.

Determining Capacities of Bins, Cribs, etc., in Bushels of Products.—One bushel of shelled corn, grain, potatoes, apples, etc., occupies 1 1/4 cubic feet of space. Ear corn requires 2.5 cubic feet per bushel.

Square or oblong bins—Volume equals length \times width \times height.

Cylindrical bins.—Volume equals 3.1416 \times radius squared \times height.

Lighting Suggestions for Barns

1. Sunshine is one of the best disinfectants.
2. A building located north and south can be lighted more effectively.
3. In practical building a barn should be so lighted that a newspaper may be read in any part.
4. Better lighting is secured when the longest dimension of the window is vertical rather than horizontal.
5. Not less than 3 square feet of window space for each animal is necessary for efficient lighting; in dairy barns allow one square foot of window space for each 20 square feet of floor space.
6. Skylights have been tried and found practical and highly satisfactory in hog houses.

Ventilation Suggestions for Barns

1. One of the best indications of an improperly ventilated barn is the condensation of moisture on the walls, ceilings and floors.
2. Ample ventilation is indispensable for maintaining the animal's power of disease resistance. A cow needs to be supplied with twice the weight of pure air that she does of food and water.
3. The essential parts of an effective ventilating system are:
 - (1) The inlets for fresh air—the total sum of their area should equal or exceed by 10 per cent the area of the outlets.
 - (2) The outlets for foul air—these should be so constructed that their sides are air tight and afford complete insulation so that air within flue will not be cooled too rapidly.
 - (3) The aerator on top of the barn—so constructed that the action of the wind exerts a suction on the air in the outlet flue.
4. Rate of supply of air to barns to provide pure air for classes of livestock.

	Cu. Ft. Per Head Per Hour
Horses -----	4924
Cows -----	3953
Hogs -----	1510
Sheep -----	929
Hens -----	37

5. The following amount of out-take flue is required to keep the air in the building sufficiently pure for livestock.

	Head
Horses ----- 1 sq. ft. cross-sectional area for	5
Cattle ----- 1 sq. ft. cross-sectional area for	6
Hogs ----- 1 sq. ft. cross-sectional area for	18
Sheep ----- 1 sq. ft. cross-sectional area for	24
Hens ----- 1 sq. ft. cross-sectional area for	400

DIMENSIONS OF STALLS AND PENS

Kind	Box Stalls or Pens (feet)	Tie Stalls	
		Length (feet)	Width (feet)
Horse			
Single -----	12x12	7*	5
Double -----		7	9
Cattle			
Beef (double) -----	10x12	5	8
Dairy average -----		5	(3½ with partition)
large -----		5½	(3 without partition)
small -----		4	
Sheep (ewe) -----	4x4		
Hogs (brood sow) -----	6x8		

* Allow 15 feet from front of manger to back of litter alley. All floors in stalls should slope back toward gutter or drain not less than 1-4 to 1-3 inch to each foot.

For cattle the gutter should be 16 inches wide and at least 4 inches deep on alley side and 8 inches on stall side.

Avoiding Legal Difficulties

1. Compromise.—Where differences of opinion arise, it is often less expensive and more satisfactory to compromise than to take the question into court.

2. Consult an Attorney.—When contemplating business deals involving questions on which you are not certain, consult a reliable attorney; consultation fees are cheaper and more satisfactory than a trial at court.

3. Written Contract.—Don't make a verbal contract when you could as well make a written one; there is more opportunity for dispute later with a verbal contract. Don't buy real estate from an incompetent person without a court order, for if the value increases he may want it back and you cannot prevent it.

4. Pay for an Option.—Insist upon paying something for another's promise to leave an offer open, because only then will it become an option; otherwise he may revoke it at his own pleasure.

5. Require Note's Surrender.—When paying a note, require its surrender, otherwise it may be sold to another and you may be required to pay it again.

6. Buying Mortgaged Property.—When buying personal property it is wise to make certain that it is not mortgaged; if it is, the holder of the mortgage can claim it.

7. Crops in Foreclosure.—Unharvested crops become the property of the purchaser of the land on a mortgage foreclosure sale.

8. Business with Bankrupt.—Don't transact business with anyone in danger of bankruptcy because no matter how much he may wish to prefer you to his other creditors, it is the purpose of the bankruptcy law to treat all creditors alike.

9. Acting as Agent.—When acting as agent for another, sign his name, after which sign yours as agent.

10. Liability of Borrower.—If you borrow a machine you are liable for all expenses necessarily arising from your use of that machine.

11. Tree on Boundary.—A tree standing on a boundary line is the property of both owners, and its disposal is subject to mutual agreement only. You cannot legally claim fruit from a tree standing upon another man's property even though the branches extend over your land.

12. Treacherous Horse.—Don't lend a treacherous horse to a neighbor without telling him of these traits. You will be liable for any harm or damage the animal may inflict.

13. Drive Carefully.—If you overtake a pedestrian and offer him a ride in your auto you are liable for any damage to him because of careless driving.

14. Partnership Liability.—If you are a legal partner, you are liable for contracts made by your partner in connection with the business. Your partner has as much authority in the conduct of the firm business as yourself. Your credit is at the mercy of your partner.

As a partner you are liable to the full extent of your own property for firm debts. If a judgment against the partnership cannot be satisfied out of firm assets, each partner will be individually liable for the full amount of the deficit.

A Selected List of Livestock Publications for the Stockman

The South Dakota bulletins and circulars may be obtained free by writing the South Dakota State College at Brookings.

EXPERIMENT STATION BULLETINS

- 182 Corn Silage for Steers.
- 189 Corn and Millet Silage for Cattle.
- 199 Sunflower Silage for Steers; Smutted Corn Silage for Pregnant Cows.
- 219 Soft Corn for Fattening Cattle.
- 229 Stacked Green Corn for Cattle.
- 255 Cattle Ranch Organization in South Dakota.
- 252 The Value of Grinding Grain and Roughages for Livestock.
- 262 Barley as a Fattener for Cattle and Swine.
- 271 Rye at a Fattening Feed for Cattle and Swine in South Dakota
- Circ 3 Preliminary Report—Feeding Flax Straw to Cattle.
- 174 Sorghums for Forage in South Dakota.
- 206 Purebred Dairy Sires.
- 198 Influence of Purebred Dairy Sires.
- 231 Feeding the Dairy Herd for Profit.
- 195 Feeding Dairy Cattle.
- 188 Relative Values of Food Protein for Dairy Cows.
- 215 Soybeans for Dairy Cows.
- 264 Emmer (Speltz) for Dairy Cows.
- 265 A Comparison of Alfalfa, Sweet Clover and Sudan grass as Pasture Crops for Dairy Cows.
- 236 Self Feeders in Dairy Calf Feeding.
- 175 The Role of Water in a Dairy Cow's Ration.
- 192 Rations for Pigs.
- 209 Potatoes as a Food for Fattening Pigs.
- 216 Improving Winter Rations for Pigs.
- 177 The Sheep.
- 207 Forage Crops for Lambs
- 226 and 235 Profitable Farming Systems.
- 225 Farm Production and Prices.
- 232 Taxes and Public Finance in South Dakota.
- 185 Ice on the Farm.

EXTENSION CIRCULARS

- 26 Advertising Farm Products.
- 29 A Suggested Farm Entrance Sign.
- 138 Farm Sanitation.
- 31 Farm Building Ventilation.
- 32 A Serviceable Farm Barn.
- 259 Alfalfa for Livestock.
- 264 Pit and Trench Silo.
- 265 Available Agricultural Engineering Circulars and Blue Print Plans.
- 244 Breeding Stock, Its Selection and Care.
- 266 Preventing Spread of Disease.
- 12 Swine Production.
- 237 Hog Lice and Hog Mange.
- 315 Pork on the Farm.
- 271 Better Team Hitches for South Dakota.
- 15 Poultry Management.
- 145 Feeding Poultry for Market.

EXTENSION LEAFLETS on Livestock Feeding are also available.

The Farmers' bulletins referred to may be obtained free by writing the Division of Publications, U. S. Department of Agriculture, Washington, D. C.

FARMERS' BULLETINS

- 1167 Essentials of Animal Breeding.
- 993 Cooperative Bull Association.
- 1008 Saving Farm Labor by Harvesting Crops with Livestock.
- 578 The Making and Feeding of Silage.
- 724 Feeding Grain Sorghums to Livestock.
- 1179 Feeding Cottonseed Products to Livestock.
- 1069 Tuberculosis in Livestock.
- 1536 Infectious Abortions in Cattle.
- 612 Breeds of Beef Cattle.
- 1068 Judging Beef Cattle.
- 1073 Growing Beef on the Farm.
- 1395 Beef Cattle Production in the Range Area.
- 1584 Feed Lot and Ranch Equipment for Beef Cattle.
- 1415 Beef on the Farm, Slaughtering, Cutting, Curing.

- 1600 Dehorning, Castrating, Branding and Marking Beef Cattle.
- 1443 Dairy Cattle Breeds.
- 1532 Dairy Herd Improvement.
- 1135 The Beef Calf.
- 1549 Feeding Cattle for Beef.
- 1272 Renting Dairy Farms.
- 1342 Dairy Barn Construction.
- 1470 Care and Management Dairy Cows.
- 1626 Feeding Dairy Cows.
- 777 Feeding and Management of Dairy Calves and Young Dairy Stock.
- 976 Cooling Milk and Cream on the Farm.
- 1604 Dairy Herd and Improvement Associations and Stories the Records Tell.
- 1263 Breeds of Swine.
- 1455 Fitting, Showing and Judging Hogs.
- 1437 Swine Production.
- 874 Swine Management.
- 1490 Hog Lot Equipment.
- 1186 Pork on the Farm.
- 834 Hog Cholera.
- 1244 Diseases, Ailments and Abnormal Conditions of Swine.
- 619 Breeds of Draft Horses.
- 779 How to Select a Sound Horse.
- 1419 Care and Management of Farm Work Horses.
- 1030 The Feeding of Horses.
- 1368 Breaking and Training Colts.
- 576 Breeds of Sheep on the Farm.
- 1199 Judging Sheep.
- 810 Equipment for Sheep Raising.
- 840 Farm Sheep Raising for Beginner.
- 1172 Farm Slaughtering, and Use of Lamb and Mutton.
- 1134 Castrating and Docking Lambs.
- 1155 Diseases of Sheep.
- 1330 Parasites and Parasitic Diseases of Sheep.
- 848 Yearbook, separate. "From Scrubs to Quality Stock."
- 1360 Department Bulletin "Market Classes and Grades of Livestock."
- 57 Technical Bulletin "Cooperative Marketing of Livestock in the United States by Terminal Associations."
- 235 Department Circular "Utility Value of Pure Bred Livestock."

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MEMORANDUM

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