

TABLE 1.
Comparing—

[OSTEOPHAGIA AND
PHOSPHORUS DEFICIENCY.]

Stabled Cattle.										Grazing Cattle.											
Mixed Ration.—2 lb. wheaten bran, 2 lb. crushed mealies, 6 lb. lucerne hay, 6 lb. Pretoria hay. Then fed upon cut veld grass only.										Mixed ration.—2 lb. wheaten bran, 2 lb. crushed mealies, 6 lb. lucerne hay, 6 lb. Pretoria hay.											
Date.	May.				June.				July.			Date.	July.			August.			September.		
	15.	16.	20.	26.	2.	12.	23.		1.	8.	15.		15.	21.	28.	5.	11.	18.	25.	1.	8.
1919.												1919.									
No. of Animal.																					
109	M								S	S	M	1743	M	M	M	M	M	M	M	M	M
126	M		M	M	M				S	M	M	2371	M	S	—	—	—	Disco	ntinue	d.	M
134	M								—	—	—	3097	M	M	M	M	M	S	S	S	—
144	M								—	—	M	3716	M	M	M	M	S	—	Disco	ntinue	d.
157	M								—	M	M	3718	M	M	M	M	M	M	M	M	M
162	M		M	M	M				S	M	M	938	M	—	M	—	—	Disco	ntinue	d.	M
164	M			S					—	—	—	3406	M	—	—	—	—	Disco	ntinue	d.	—
167	M		M	S					S	M	M	957	M	—	—	—	—	Disco	ntinue	d.	—
124	M	16th May, Stabled.	M	—					—	S	—	2892	—	—	—	—	—	—	Disco	ntinue	d.
Per cent. M	100		44	22	22	0	0		0	44	67	Per cent. M	90	40	60	40	30	20	20	20	20

Note.—See page 1213 of text.

M signifies marked osteophagia ; S signifies slight osteophagia ; — signifies no craving at all.

TABLE 2.

Grass-feeding.

Four common grasses of the veld : *Themeda triandra*, *Cymbopogon excavatus*, *Digitaria eriantha*, *Aristida uniplumis*; fed separately to stabled or kraaled cattle.

		Red Grass (<i>Themeda triandra</i>).						Thatch Grass (<i>Cymbopogon excavatus</i>).							
Date.	1919.	June.			July.			Date.	1919.	June.			July.		
		12.	23.		1.	8.	15.			21.	23.	1.		8.	15.
No. of Animal.		Reduced cravers.			Commenced 27th.					Stabled.			Commenced.		
109		—	—		S	S	M	M	M	M	M	M	M	M	M
144		—	—		—	—	—	—	—	—	—	—	—	—	—
164		—	—		—	—	—	—	—	—	—	—	—	—	—
3994		—	—		—	—	M	—	—	—	—	S	—	—	—
4101		—	—		—	—	M	—	—	—	—	—	—	—	—
Per cent. M		0	0		0	0	60	40		40	40		40	40	80

		Kruil Grass. (<i>Digitaria eriantha</i>).						Besem Grass (<i>Aristida uniplumis</i>).							
Date.	1918.	September.					October.	Date.	1919.	September.					
		1.	8.		15.	22.	29.			6.	13.	1.	8.		15.
No. of Animal.		Reduced cravers.			Commenced 10th.					Reduced cravers.			Commenced 10th.		
123		—	—		—	—	M	M	—	—	S	—	S	M	
124		—	—		—	—	S	S	—	—	—	—	S	M	
4051		—	—		S	S	M	M	—	—	—	—	M	M	
4175		—	—		—	—	M	M	—	—	—	—	—	M	
4339		—	—		—	—	S	S	—	—	—	—	—	S	
Per cent. M		0			0	0	60	60		0	0		20	20	60
4532		Craver	M	M	M	M	M	M		Cr.	M	M		M	M

TABLE 3.
Grass-feeding.

Armoedsvlakte Grass Fed to Stabled Cattle.												Armoedsvlakte Hay and Pretoria Hay compared on Kraaled Cattle.						
Date.	July.			August.				September.				Date.	June.		July.			
	1919.	23.	1.	8.	15.	21.	28.	5.	11.	18.	25.		1919.	12.	23.	1.	8.	15.
No. of Animal.												No. of Animal.						
4096	M	M	M	—	S	M	—	—	—	—	—	157	—	—	S	M	M	
4400	M	M	M	M	M	M	M	M	M	M	M	162	—	—	S	M	M	
4407	M	M	M	M	M	M	M	M	M	M	M	167	—	—	—	M	M	
4408	M	—	—	M	M	M	—	—	S	M	—	3933	—	—	S	—	—	
4434	M	M	M	M	M	M	M	M	S	—	—	3991	—	—	S	M	M	
Per cent. M		100	80	80	80	100	60	60	40	60		Per cent. M	0		0	80	60	
3990	Reduced cravers.	—	—	—	M	M	M	M	Transf.		124				—	S	—	
4051		—	—	—	M	S	—	S	S	M	126			—	S	M	M	
124		—	—	S	—	M	S	—	—	—	134			—	—	—	—	
126		—	—	M	M	M	M	M	—	—	3867			—	—	—	—	
134		—	—	—	—	—	—	—	—	—	4177			S	M	M	—	
3867		—	—	—	—	—	—	—	—	—				—	—	—	—	
4177		—	—	M	M	M	S	M	M	S	—			—	—	—	—	
Per cent. M		0	0	30	60	60	30	40	30	0	15				0	40	40	

TABLE 4.

Kraaled cattle fed upon maize meal, 5 lb., and lucerne hay, 5 lb., reduced to 4 lb. of each on 26th August ; one lot receiving in addition 2 lb. of grass ash obtained by burning the veld, the other lot acting as controls.

Maize Meal and Lucerne, plus Grass Ash.												Maize Meal and Lucerne alone.													
Date.		July.			August.				September.				Date.		July.			August.				September.			
1919.		27.			5.	11.	18.	25.	1.	8.	15.	22.	1919.		27.	5.	11.	18.	25.			1.	8.	15.	22.
No. of Animal.		Reduced cravers.		Commenced 30th.										Reduced cravers.		Commenced.									
107													103												
161													109												
162													135												
174								z					167												
3994													3990												
4298													4024												
4344							z						4101												
165													168												
193													196												
200													203												
Per cent. M.					0	0	0	0	0	0	0	0	Per cent. M.			0	0	0	0			0	0	0	0
												On 26th ration reduced to 4 lb each of mealie meal and lucerne.													
												Ration reduced to 4 lb. each of mealie meal and lucerne.													

TABLE 5.

Permanent Controls. Grazing on the Veld.—LOT I.

Date. 1919-1920.	May.			June.			July.					August.				September.				October.			November.						
	12.	20.	27.	2.	11.	16.	23.	1.	8.	15.	21.	28.	5.	11.	18.	25.	1.	8.	15.	22.	29.	7.	13.	20.	27.	3.	10.	17.	24.
No. of Animal.	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2632.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3159.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3306.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3321.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3381.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3473.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3561.....	—	—	—	—	S	S	S	S	S	S	S	S	S	Exi	t.	—	—	—	—	—	—	—	—	—	—	—	—	—	
3634.....	—	—	—	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3678.....	—	M	—	—	M	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
2819.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3852.....	M	M	M	—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3992.....	—	—	—	—	—	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3995.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
4536.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
4538.....	—	—	M	M	—	—	—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
4541.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
4543.....	—	—	—	—	M	M	—	—	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2577.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3174.....	—	—	—	—	—	—	—	—	—	—	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3594.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Per cent. showing marked craving.....	40	45	40	40	50	50	60	60	65	65	65	75	80	65	70	50	50	60	60	55	50	55	45	55	35	15	5	5	35

TABLE 5—(continued).

Date. 1919-1920.	December.				January.				February.				March.				April.				May.				June.				
	1.	8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.	8.	15.	22.	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.
No. of Animal.	M	M	M	M	M	M	M	M	M	M	M	—	S	M	M	M	S	M	M	M	M	M	M	M	M	M	M	M	M
2632.....	M	M	M	M	M	M	M	M	M	M	M	—	S	M	M	M	S	M	M	M	M	M	M	M	M	M	M	M	M
3159.....	—	M	M	M	M	M	M	M	M	M	M	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3306.....	—	M	M	M	M	M	M	M	M	M	M	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3331.....	M	M	M	M	M	M	M	M	M	M	M	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3381.....	M	M	M	M	M	M	M	M	M	M	M	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3473.....	M	M	M	M	M	S	S	S	S	S	—	Exi ^t .	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3561.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3634.....	—	M	M	M	M	M	M	M	M	M	M	—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3678.....	—	M	M	M	M	M	M	M	M	M	M	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3819.....	S	M	M	M	M	M	M	M	M	M	M	—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3852.....	M	M	M	M	M	M	M	M	M	M	M	—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3992.....	S	M	M	M	M	M	M	M	M	M	S	—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3995.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4536.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4538.....	M	M	M	M	M	M	M	M	M	M	S	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4541.....	—	—	—	—	S	S	—	—	—	—	S	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4543.....	S	M	M	M	M	M	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2577.....	M	M	M	M	M	M	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3174.....	S	M	M	M	M	M	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3594.....	S	M	M	M	M	M	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Per cent. showing marked craving.....	45	85	85	80	90	80	70	80	65	80	65	50	70	80	80	80	75	85	80	80	85	80	80	80	80	80	80	80	80

NOTE.—M signifies marked craving. S signifies slight craving. A blank signifies (—) absence of craving.
See text for method of testing and modification of 29th September.

TABLE 6.
LOT II.—*Permanent Controls.*

Date— 1920.	Feb.			March.					April.				May.				June.		
	10.	17.	23.	2.	8.	15.	22.	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.
No. of Animal.																			
118.....	—	—	—	—	—	S	—	—	—	M	—	M	S	M	M	M	M	M	M
126.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S	—	M
130.....	—	—	—	—	—	—	—	—	M	—	—	—	—	—	—	—	—	—	—
165.....	—	—	—	—	—	S	—	—	—	—	—	—	—	—	—	—	S	—	M
174.....	—	—	—	—	—	—	—	—	—	M	—	—	—	—	—	—	S	S	—
214.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S	S	S	M	S
239.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S
241.....	—	—	—	—	—	—	—	—	—	S	S	S	—	M	M	S	M	M	M
243.....	—	—	—	—	—	—	—	—	—	—	M	M	—	—	S	—	—	—	S
252.....	—	—	—	—	S	—	—	—	—	—	—	—	—	—	—	—	S	S	S
256.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1188.....	S	—	—	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4170.....	S	—	—	—	S	S	S	S	M	M	M	M	M	S	—	—	M	M	S
4174.....	—	—	—	—	—	—	—	—	—	M	—	S	—	—	M	—	S	M	M
4347.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4667.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4748.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S	M
4825.....	—	—	—	—	—	—	S	M	M	M	M	M	M	M	M	M	M	M	M
4826.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4848.....	—	—	—	—	—	—	—	—	—	—	M	S	S	M	—	—	S	M	S

NOTE.—M signifies marked craving; S signifies slight craving.

TABLE 7.
Rainfall, 1919-1920.

Date.	Inches.	Date.	Inches.	Date.	Inches.
1919.		1919.		1920.	
May.....	nil.	November Total.....	1.19	February 27th.....	.01
June.....	nil.	December 4th.....	.26	" 28th.....	.05
July 7th.....	.02	" 6th.....	.01	Total.....	5.59
August 9th.....	.07	" 22nd.....	.13	March 1st.....	.09
" 21st.....	.05	" 28th.....	.08	" 2nd.....	1.02
" 28th.....	.01	" 30th.....	.41	" 3rd.....	.57
Total.....	.13	Total.....	.89	" 4th.....	.20
September 4th.....	.06	1920.		" 10th.....	.02
" 11th.....	.22	January 1st.....	.09	" 19th.....	.02
" 12th.....	.19	" 9th.....	.11	" 22nd.....	.37
" 18th.....	.01	" 10th.....	.07	Total.....	2.29
Total.....	.48	" 13th.....	.41	April 11th.....	.02
October 16th.....	.03	" 14th.....	.59	" 12th.....	.06
" 17th.....	.02	" 19th.....	.65	" 13th.....	.08
" 29th.....	.37	" 28th.....	.03	" 14th.....	.01
" 30th.....	.21	" 29th.....	1.60	Total.....	.17
" 31st.....	.07	" 30th.....	1.35	May 10th.....	.03
Total.....	.70	" 31st.....	1.62	" 11th.....	.01
November 1st.....	.68	Total.....	6.52	" 12th.....	.02
" 5th.....	.05	February 1st.....	1.62	Total.....	.06
" 6th.....	.24	" 4th.....	.62	June.....	nil.
" 7th.....	.10	" 5th.....	.30	Total for year May, 1919, to	
" 19th.....	.01	" 6th.....	.65	May, 1920.....	18.00
" 20th.....	.07	" 8th.....	.03		
" 24th.....	.04	" 9th.....	.52		
		" 13th.....	1.21		
		" 14th.....	.13		
		" 21st.....	.45		

TABLE 8.

Percentage Phosphoric Oxide in Dry Matter of Natural Grazing at Armoedsvlakte.

Small Sampling Camp.

Date.	P ₂ O ₅ .	Date.	P ₂ O ₅ .	Date.	P ₂ O ₅ .	Date.	P ₂ O ₅ .
1919.		1919.		1920.		1920.	
May (old grass).....	} ·08	Dec. 1st....	·37	Feb. 4th....	·24	April 6th...	·12
June.....		„ 8th....	·32	„ 10th....	·29	„ 13th...	·11
October (young grass)		„ 22nd....	·26	„ 17th....	·34	„ 19th...	·11
Nov. 10th....	·65	„ 31st....	·22	„ 24th....	·32	„ 27th...	·08
„ 18th....	·60	Jan. 8th, 1920	·23	March 4th..	·24	May 5th....	·10
„ 25th....	·55	„ 15th....	·22	„ 16th..	·24	„ 11th....	·07
	·40	„ 21st....	·29	„ 25th..	·26	„ 25th....	·05
		„ 27th....	·27	April 2nd..	·15	June 2nd...	·13

Camp A (Hospital camp).

March 5th..	·13	April 2nd..	·19	April 27th...	·08	May 25th...	·06
„ 12th..	·12	„ 6th...	·13	May 5th....	·07	June 2nd...	·06
„ 17th..	·12	„ 13th...	·08	„ 11th....	·05	„ 8th....	·04
„ 25th..	·15	„ 19th...	·09	„ 18th....	·07	„ 15th....	·05

Camp A (Paddock A).

March 4th...	·24	April 2nd...	·14	May 11th...	·08	June 2nd...	·05
„ 17th...	·29	„ 21st....	·18	„ 25th...	·07	„ 6th....	·07

TABLE 9.

Proximate Analysis of Dry Matter of Grass in Sampling Camp at Armoedsvlakte.

Date.	Crude Protein.	Ether Extract.	Nitrogen-free Extractives.	Crude Fibre.	Ash.	P ₂ O ₅ .	CaO.	Starch Equivalent.
10th Nov., 1919...	19·4	5·5	41·0	22·5	11·6	·60	(·31)	(56)
8th Dec., 1919....	14·3	5·6	46·8	25·6	7·7	·32	·59	—
15th Jan., 1920...	13·8	5·5	48·0	25·0	7·7	·22	·50	(52)
4th March, 1920...	7·2	3·4	49·8	33·7	5·9	·24	·43	—
19th April, 1920...	4·9	2·4	51·6	35·0	6·1	·11	·46	(32)
11th May, 1920...	4·1	2·2	52·9	34·9	5·9	·07	·50	—
8th June, 1920....	4·0	2·0	53·7	33·1	7·2	·09	·59	(25)
<i>For Comparison—European Figures.</i>								
Rich pasture grass.	20·5	4·6	45·9	19·0	10·0	(·7)	(·9)	60
Poor meadow hay..	8·7	1·7	44·8	39·0	5·8	(·4)	(·9)	22

TABLE 10.—MISCELLANEOUS ANALYSES.

Proximate Composition of Air-dry Material.

	Moisture.	Crude Protein.	Ether Extract.	Crude Fibre.	Nitrogen-free Extractives.	Ash.	Phosphoric Oxide.	Lime.	Magnesia.
	%	%	%	%	%	%	%	%	%
Lucerne hay (1919).....	5.9	10.9	3.5	31.0	39.9	8.8	.54	1.20	.31
Lucerne hay (1920).....	7.6	11.8	2.6	37.9	32.8	7.3	.37	1.50	.32
Poor Pretoria hay.....	7.3	2.1	1.7	34.5	46.8	7.6	.17	.19	.17
Armoedsvlakte hay (May, 1919).....	5.6	2.7	2.2	29.0	50.9	9.6	.08	.23	.18
Chaff.....	6.2	3.4	2.4	36.7	44.9	6.4	.16	.10	.06
<i>Digitaria eriantha</i> (June, 1919).....	5.7	3.5	1.8	27.9	50.7	10.4	.08	.32	.11
<i>Aristida uniplumis</i> (June, 1919).....	5.0	3.0	1.5	40.6	44.7	5.2	.05	.19	.04
Muis grass (June, 1920...)	6.8	3.0	2.6	32.1	48.2	7.3	.07	.71	.34
Rosijntje Bos (Dec., 1919)	6.5	19.9	4.4	18.4	45.0	5.8	.57	1.6	.96
Manured camp A (8th June, 1920).....	5.9	3.0	2.9	33.0	46.3	8.9	.30	.92	.57
Manured camp B (9th June, 1920).....	6.5	2.8	2.2	33.6	47.6	7.3	.23	.67	.33
Control to manured camp (9th June, 1920).....	6.9	3.9	3.9	27.7	48.6	9.0	.07	.99	.47

NOTE.—Ash, lime, and magnesia sometimes high, owing to contamination with dolomitic dust.

Percentage Phosphoric Oxide in Miscellaneous Materials.

Maize samples, 0.42-0.52; maize bran, 0.23-0.77; wheaten bran, 1.7-2.1, beans, 0.72; Fanko, 0.09-0.11.

Phosphoric acid, 64 gm. to 75 gm. per 100 c.c. Sodium phosphate, 21. Calcium phosphate, 40. Mineral phosphate, 31, with iron and alumina, 1.5. Bonemeal ranging round 24, with "citric-soluble" 16. Dissolved bonemeal, 15 (water soluble). Bone-ash, 39. Dissolved bone-ash, 20, with "citric-soluble" 16. Whale-meal, 11.7.

TABLE 11.

Fifty Oxen (used for Working), on Varying Bonemeal Allowance.

Date.	May.					June.				July.					August.				
	25.	5.	13.	20.	28.	2.	12.	16.	23.	1.	8.	15.	21.	28.	5.	12.	19.	25.	
1919-1920.																			
No. of Animal.																			
2265	—	—	—	—	—	—	—	—	—	—	—	—	—	M	—	—	—	—	
2269	M	M	—	S	S	S	S	S	—	—	—	M	S	M	M	S	—	—	
2324	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2325	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2329	M	—	—	—	—	—	—	—	—	—	—	—	—	—	M	S	M	—	
2340	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2345	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2348	M	—	—	—	—	—	—	—	—	—	—	—	—	—	S	M	—	S	
2350	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2357	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2360	M	M	—	S	M	M	S	M	—	S	M	M	M	S	M	M	S	S	
2366	M	M	—	S	S	S	S	—	—	—	—	—	—	—	—	—	—	—	
2423	M	—	—	S	S	S	S	M	—	—	S	M	M	M	M	M	—	—	
2424	M	—	—	S	S	—	—	—	—	—	—	—	—	—	—	—	—	—	
2425	M	M	—	S	S	—	—	S	—	—	—	—	—	—	—	M	—	—	
2429	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2431	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2462	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	M	M	
2465	M	—	—	S	S	S	S	S	S	S	M	M	M	M	M	M	M	M	
2506	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2513	M	M	M	S	S	S	S	S	—	—	—	—	S	S	—	—	S	S	
2352	M	—	—	—	—	—	—	—	—	S	S	M	M	M	M	M	S	S	
2378	M	M	—	S	S	S	S	S	S	—	—	—	—	—	—	—	M	S	
2380	—	—	—	—	—	—	—	—	—	S	M	S	S	—	—	—	S	S	
2397	M	—	—	—	S	—	—	—	—	—	—	—	—	—	—	—	—	—	
2903	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2918	M	M	—	S	S	S	S	—	S	M	S	S	S	—	M	M	M	M	
3027	—	—	—	S	S	S	S	—	—	—	—	—	—	—	—	—	—	S	
3043	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	M	
3090	—	—	—	S	S	—	—	—	—	M	—	—	—	—	—	—	—	—	
3162	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3177	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3212	M	M	M	S	M	M	S	M	M	M	M	M	M	M	M	M	M	M	
3240	M	M	M	S	S	S	S	—	—	—	—	—	—	—	—	—	—	—	
3501	M	—	—	S	S	S	S	M	—	S	M	M	M	M	M	M	S	M	
3502	M	—	—	S	S	S	S	—	—	—	—	—	—	—	—	—	—	—	
3557	M	—	—	—	—	—	—	—	—	S	S	S	M	S	—	—	—	—	
3586	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3635	M	—	—	—	S	—	—	—	S	S	M	M	M	M	M	M	S	S	
3648	—	—	—	—	S	S	S	S	S	S	M	M	M	M	M	S	S	S	
3676	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3710	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3711	—	—	—	—	—	—	—	—	—	—	—	M	—	—	—	—	—	—	
3809	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3863	M	—	—	—	—	—	—	—	—	—	—	—	S	M	—	M	—	—	
3899	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2054	—	—	—	—	—	—	—	—	—	—	—	—	M	—	—	S	—	—	
2699	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2747	—	—	—	—	—	—	—	—	S	S	M	M	S	S	S	M	—	—	
3883	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3621	—	—	—	—	—	—	—	—	S	M	M	M	M	M	M	M	M	M	
Marked craving, %	59	18	6	0	4	4	0	10	2	8	14	28	24	22	28	30	18	14	

NOTES.

M = Marked craving. S = Slight craving. — Signifies absence of craving for bones.
 25th April, allowance of 8 oz. bonemeal per head per day.
 28th June, bonemeal discontinued.
 31st December, 1920, allowance of 1 lb. bonemeal and ½-lb. of bran per head per day, reduced to 3 oz. bonemeal and 3 oz. bran as fast as the animals lost their craving. By 17th February all were on the low ration of bonemeal.
 Animals originally a mixed lot derived from various districts, in some of which osteophagia is absent.

TABLE 11—(continued).

Date. 1919-1920.	September.				October.					November.				December.					January.				
	1.	8.	15.	23.	1.	8.	13.	21.	27.	3.	11.	17.	25.	2.	9.	16.	23.	30.	5.	13.	19.	26.	
No. of Animal.																							
2265			s		s	s				s				s	M	M	M						
2269															M	M	M						
2324															M	M							
2325																							
2329																							
2340																							
2345																							
2348	M	s																					
2350																							
2357																							
2360	s	s	s		s	s	s																
2366																							
2423	s			s	s	M																s	
2424					s	s																	
2425																							
2429																							
2429																							
2461																							
2462	M	M			s	s	s	M	s	s	s		M	M	M	M	M	M					
2465	s	M	M		M	s	s	s	M	s	s		M	M	M	M	M	M					
2506																							
2513	M	s																					
2522	s	s	s																				
2578	s	s	s		s	s	s																
2580					s	s		M	s	s	s												
2587																							
2597																							
2903																							
2918	s	M	M	s	M	M	M		s	s	s												
3027																							
3043																							
3090	M	M			M																		
3162	s																						
3177																							
3212	M	s	M	M	M	M	s	s	M	s	s												
3240																							
3501	M	M	M	M	M	M	M	M															
3502																							
3557	s	s	s																				
3586	s	s	s		M	M																	
3635	s	s	s	s	s	s																	
3648	s	s			s	s																	
3676																							
3710					M	s	s																
3711																							
3809																							
3863					s																		
3893																							
3899																							
3921																							
2054																							
2699																							
2747		s			s																		
3833																							
3821	M	M	M		s	M	s	M	M	s	s	s	s	s	s	M	M	M	M	M	M	M	M
Marked craving, %	14	12	10	4	16	12	4	8	8	0	4	0	8	12	20	40	68	54	12	4	2	2	

NOTES.

31st December, 1920, allowance of 1 lb. bonemeal and $\frac{1}{2}$ -lb. of bran per head per day, reduced to 3 oz. bonemeal and 3 oz. bran as fast as the animals lost their craving. By 17th February all were on the low ration of bonemeal.

TABLE 11—(continued).

Date. 1919-1920.	February.				March.					April.				May.			
	2.	9.	16.	23.	1.	8.	15.	22.	29.	5.	12.	19.	26.	3.	10.	17.	24.
No. of Animal.																	
2265.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2269.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2324.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2325.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2329.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2340.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2345.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2348.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2350.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2357.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2360.	s	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2366.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2423.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2424.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2425.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2429.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2461.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2462.	s	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2465.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2508.	s	—	—	—	—	—	—	s	—	s	—	s	s	s	—	—	—
2513.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2852.	—	—	M	—	—	—	—	—	—	s	s	s	—	—	—	—	—
2875.	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2880.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2897.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2903.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2918.	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3027.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3043.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3090.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3162.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3177.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3212.	—	s	—	—	—	—	—	—	—	—	—	—	—	s	—	—	—
3240.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3501.	s	—	s	—	s	—	—	s	—	M	M	M	M	s	s	s	—
3502.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3557.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3586.	—	—	—	—	—	—	—	—	—	—	—	s	—	—	—	—	—
3635.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3643.	s	s	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3676.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3710.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3711.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3809.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3863.	s	—	—	—	—	s	—	—	—	—	—	—	—	—	—	—	—
3899.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2054.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2699.	s	—	—	—	—	—	—	M	M	—	—	M	s	M	M	M	—
2747.	s	s	s	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3833.	s	s	—	—	—	—	—	—	—	—	—	s	s	s	M	M	—
3621.	s	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Marked craving, %	6	0	2	0	2	0	0	2	2	0	4	2	4	2	4	4	4

TABLE 12.

Cattle Supplied with Varying Amounts of Bonemeal.

Date. 1919-1920.	May.			June.				July.					August.				September.					
	13.	19.	26.	3.	11.	16.	23.	1.	8.	15.	21.	28.	5.	11.	18.	25.	1.	8.	15.	22.	29.	
No. of Animal.																						
151.....	M	M	M	M	M	M	M	M	M	M	M	S	M	S	M	—	—	—	—	—	—	
171.....	M	M	M	M	M	M	M	M	M	S	—	—	S	S	S	—	—	—	—	—	—	
186.....	M	M	M	M	M	M	M	M	M	M	M	—	—	—	—	—	—	—	—	—	—	
2361.....	M	M	—	M	M	—	M	—	M	—	—	—	—	—	—	—	—	—	—	—	—	
2790.....	M	M	M	M	M	M	M	M	M	M	M	—	M	M	—	—	M	M	M	M	M	
3802.....	M	M	M	—	M	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3826.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	S	S	S	—	—	S	
4088.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	S	S	M	M	M	M	
4338.....	M	M	M	M	M	M	S	S	—	—	—	—	—	—	—	—	—	—	—	—	—	
4549.....	M	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Percentage showing marked craving.....	100	100	90	90	100	70	70	50	60	80	50	50	40	30	20	10	10	30	20	20	20	

Date. 1919-1920.	October.				November.				December.					January.				February.			
	7.	13.	20.	27.	3.	10.	17.	24.	1.	8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.
No. of Animal.																					
151.....	S	S	S	S	S	—	S	S	S	M	M	M	M	—	S	S	—	M	—	S	—
171.....	—	—	S	S	S	—	—	S	S	M	M	M	S	S	S	—	S	—	—	—	—
186.....	—	—	S	S	S	—	—	S	S	—	M	—	S	—	—	—	—	—	—	—	—
2361.....	—	—	S	S	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2790.....	M	M	M	S	—	S	S	S	M	M	M	M	S	S	S	—	—	—	S	—	—
3802.....	—	—	S	S	—	—	—	—	—	—	S	S	S	—	—	—	—	—	—	—	—
3826.....	—	S	—	S	—	—	—	S	M	M	M	S	S	—	S	—	—	—	—	—	—
4088.....	—	M	M	—	S	—	—	—	S	M	M	M	S	M	—	—	M	M	—	S	M
4338.....	—	—	—	—	—	—	—	—	—	—	M	—	—	—	—	—	—	—	—	—	—
4549.....	—	—	—	—	—	—	—	S	M	M	M	M	S	—	—	—	S	M	S	S	M
Percentage showing marked craving.....	10	20	20	10	0	0	0	0	30	60	80	50	10	10	0	0	—	—	—	—	—

Date. 1919-1920.	March.					April.				May.				June.	
	1.	8.	15.	22.	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.
No. of Animal.															
151.....	—	—	—	—	—	S	—	—	—	S	—	—	—	—	—
171.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
186.....	—	—	—	—	—	—	M	S	M	M	M	M	M	M	M
2361.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2790.....	—	—	—	—	—	—	—	—	—	—	S	S	S	S	S
3802.....	—	—	—	—	—	—	—	—	—	—	S	—	—	—	—
3826.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4088.....	M	S	M	—	—	M	M	S	M	M	M	M	S	M	M
4338.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4549.....	M	M	M	M	M	—	M	M	M	M	M	M	M	M	M

NOTES.

From 19th June, 1919, to 10th September, bonemeal supplied, 4 oz. per head per day.
 Bonemeal varied from 6 oz. to nil between September 10th and November 11th.
 Bonemeal discontinued November 11th to December 16th.
 8 oz. Bonemeal per head per day from December 16th.
 Bonemeal continued with Nos. 151, 171, 2790, 3826, 4338.
 Bonemeal discontinued with Nos. 186, 2361, 3802, 4088, 4549, from 19th January.

TABLE 13.

Original Bonemeal Lots.

Date. 1919.	March.		April.			Date. 1919.	March.		April.			May.				June.				July.				August.				
	6.	15.	2.	15.	26.		6.	15.	2.	11.	26.	5.	13.	19.	27.	3.	12.	6.	23.	1.	8.	15.	21.	28.	5.	11.	18.	
No. of Animal.						No. of Animal.																						
2183.....	—	—	—	S	M	982.....	—	—	—	—	—	—	—	—	—	—	S	S	M	M	M	S	M	M	M	M	—	—
2889.....	—	—	S	S	M	2314.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S	M	M	M	M	M	M
3383.....	—	—	—	—	—	2431.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3556.....	—	—	—	—	—	2646.....	—	—	S	S	S	—	—	—	—	—	—	—	M	S	M	M	M	M	M	M	M	S
3676.....	—	—	—	—	M	2648.....	—	—	—	—	—	—	—	—	—	—	—	M	S	M	M	M	M	M	M	M	M	
3718.....	—	—	—	S	M	3371.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3863.....	—	—	—	—	M	3596.....	—	—	—	—	—	—	—	—	—	—	—	S	M	M	M	M	M	M	M	M	M	
3866.....	—	—	—	—	M	3707.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3872.....	—	—	S	S	M	3800.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S	—	—	
						4027.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S	
Percentage marked craving.....	0	0	0	0	80		0	0	0	0	0	0	0	0	0	0	20	0	30	40	40	40	50	50	50	60	50	40

NOTES.—Previously fed on 8 oz. of bonemeal per head per day. Bonemeal discontinued on 19th March.

Previously fed on 8 oz. of bonemeal per head per day.

Bonemeal discontinued on 19th May.
M = marked craving.
S = slight craving.
— = absence of craving.

TABLE 14.
Bonemeal-feeding.

Date. 1919.	(a) Very fine bonemeal, 8 oz. per head per day.								Date. 1919-1920.	(b) 4 oz. bonemeal given per head per day. On 20th January half of the animals discontinued; to act as controls.																														
	May.		June.			July.				December.				January.			February.			March.			April.			May.		June.												
	19.	26.	2.	11.	16.	23.	1.	8.		8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.	8.	15.	22.	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.			
No. of Animal.								No. of Animal.																																
107.....	M	M	M	-	S	-	-	168.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M			
3858.....	-	-	-	-	-	-	-	251.....	-	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
3904.....	M	M	-	M	-	-	-	4106.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3933.....	M	M	M	M	M	M	-	4351.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3990.....	M	M	M	M	M	M	-	3601.....	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3991.....	M	-	-	-	-	-	-	3406.....	M	M	M	M	M	S	-	-	-	S	S	M	M	M	M	M	M	M	M	M	S	M	M	M	M	M	M	M	M	M	M	
3994.....	M	-	-	-	-	-	-	3247.....	M	M	M	M	M	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4051.....	M	M	M	M	S	S	S	2571.....	M	M	M	M	M	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4101.....	M	-	-	-	-	-	-	957.....	M	S	M	M	M	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4357.....	M	M	-	-	-	S	-	3221.....	S	S	M	M	M	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percentage M.	80	50	30	30	10	10	0	Percentage M	50	70	100	100	Bonemeal feeding commenced.	80	40	0	Discontinued.	0	{	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 14—(continued).

(c) Disguised Bonemeal Experiment.																	(d) Bonemeal 4 oz. per head twice a week.																									
Aromatic spices, 1 oz. On 20th June, 8 oz. bonemeal added.																																										
Date.		May.				June.				July.				August.				Sept.		Date.		Ap.		May.				June.				July.				Aug.						
1919.		9.	12.	20.	26.	2.	11.	16.	23.	1.	8.	15.	21.	28.	5.	11.	18.	25.	1.	8.	1919.		26.	5.	13.	19.	27.	3.	12.	16.	23.	Discontinued.				1.	8.	15.	21.	28.	5.	11.
No. of Animal.																																										
2636.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	S	—	2388.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M			
2859.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	—	—	—	3604.....	S	—	—	—	—	M	—	M	M	M	M	M	M	M	M	M	M	M	M		
2889.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	S	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
3318.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	S	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
3410.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
3872.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	—	M	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
3876.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M				
4098.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
4351.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Percentage M...		100	100	100	100	100	100	100	100	100	100	100	90	90	66	45	45	33	22	11	Percentage M...	22	45	45	55	33	33	45	33	45												

TABLE 15.
Forty-nine Grazing Cattle on Ration of Bonemeal and Bran.

Date. 1919-1920.	December.				January.				February.				
	15.	23.	29.	6.	15.	19.	26.	2.	9.	16.	23.		
No. of Animal.													
110.....	M	M	S	M	S	—	—	—	M	—	—	—	
137.....	S	M	M	M	—	—	—	—	S	—	—	—	
164.....	M	M	M	M	—	—	—	—	M	—	—	—	
191.....	—	—	S	M	—	—	—	—	—	—	—	—	
203.....	M	M	M	M	—	s	—	—	M	—	—	—	
210.....	M	S	M	M	S	M	—	—	M	—	—	—	
231.....	—	—	—	M	M	—	—	—	M	—	—	—	
235.....	S	M	—	M	M	M	—	—	M	—	—	—	
244.....	—	—	S	M	—	—	—	—	M	—	—	—	
248.....	M	M	M	M	M	M	—	—	M	—	—	—	
2482.....	S	S	M	M	S	—	—	—	M	—	—	—	
3506.....	M	S	M	M	—	—	—	—	S	—	—	—	
3841.....	M	M	M	M	—	—	—	—	—	—	—	—	
4006.....	—	—	—	M	S	—	—	—	—	—	—	—	
4263.....	S	M	M	M	—	—	—	—	—	—	—	—	
4300.....	S	M	M	M	—	—	—	—	—	—	—	—	
4372.....	S	M	M	M	—	—	—	—	—	—	—	—	
4671.....	S	M	M	M	M	—	—	—	—	—	—	—	
4820.....	M	M	M	M	M	—	—	—	—	—	—	—	
4828.....	M	M	M	M	S	—	—	—	—	—	—	—	
4830.....	S	—	M	M	M	—	—	—	—	—	—	—	
4831.....	M	M	M	M	M	—	—	—	—	—	—	—	
4836.....	M	M	M	M	—	—	—	—	—	—	—	—	
4838.....	S	S	M	M	M	—	—	—	—	—	—	—	
4841.....	S	M	M	M	S	—	—	—	—	—	—	—	
Per cent. marked craving.....													
134.....	M	M	M	M	—	—	—	—	S	S	M	—	
146.....	—	M	M	M	S	—	—	—	—	—	—	—	
166.....	M	M	M	M	M	—	—	—	S	—	—	—	
206.....	S	M	M	M	M	—	—	—	—	—	—	—	
212.....	S	M	M	M	M	—	—	—	—	—	—	—	
213.....	S	M	M	M	M	—	—	—	—	—	—	—	
246.....	S	M	M	M	M	—	—	—	—	—	—	—	
247.....	—	M	M	M	M	—	—	—	—	—	—	—	
259.....	S	M	M	M	M	—	—	—	—	—	—	—	
268.....	—	—	—	M	M	—	—	—	—	—	—	—	
3082.....	S	S	—	M	M	—	—	—	—	—	—	—	
3707.....	—	S	M	M	M	—	—	—	—	—	—	—	
3873.....	—	S	M	M	M	—	—	—	—	—	—	—	
4026.....	M	S	M	M	M	—	—	—	—	—	—	—	
4298.....	S	M	M	M	M	—	—	—	—	—	—	—	
4340.....	S	M	M	M	M	—	—	—	—	—	—	—	
4351.....	S	—	M	M	M	—	—	—	—	—	—	—	
4761.....	—	S	M	M	M	—	—	—	—	—	—	—	
4827.....	M	M	M	M	M	—	—	—	—	—	—	—	
4829.....	M	M	M	M	M	—	—	—	—	—	—	—	
4835.....	S	M	M	M	M	—	—	—	—	—	—	—	
4837.....	S	M	M	M	M	—	—	—	—	—	—	—	
4840.....	S	M	M	M	M	—	—	—	—	—	—	—	
4844.....	S	S	M	M	M	—	—	—	—	—	—	—	
Per cent. marked craving.....	39	72	82	100	40	8	20	32	20	16	8		

8th January, all supplied with 1 lb. of bonemeal and 1/4 lb. of bran per head per day.

With lower numbers, ration discontinued altogether 22nd January. With upper numbers, ration given once a week.

17th February, all supplied with 3 oz. of bonemeal and 3 oz. of bran per head per day.

TABLE 15—(continued).

Date. 1919-1920.	March.					April.				May.				June.		
	1.	8.	15.	22.	29.	5.	12.	19.	26.	3.	12.	17.	24.	1.	7.	14.
No. of Animal.																
110.....	—	—	—	—	—	—	—	—	S	—	—	S	—	—	—	—
137.....	M	—	—	—	M	—	—	—	—	—	—	—	—	—	—	—
164.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
191.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
203.....	M	M	M	M	M	removed.				—	—	—	—	—	—	—
210.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
231.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
235.....	—	—	—	—	—	—	—	—	—	S	S	—	—	—	—	—
244.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
248.....	—	—	—	—	M	M	M	M	M	S	M	—	—	—	—	—
2482.....	S	—	—	—	—	—	S	—	—	—	—	—	—	—	—	—
3506.....	—	—	—	—	—	—	—	—	S	M	M	—	—	—	—	—
3841.....	—	—	—	—	—	—	—	—	—	—	—	—	S	—	—	—
4006.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4263.....	—	—	—	—	—	—	—	—	—	—	—	—	S	—	—	—
4300.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4372.....	—	—	—	—	—	—	S	M	—	—	S	—	—	—	—	—
4671.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4820.....	—	—	—	—	—	—	—	—	—	M	M	—	—	—	—	—
4828.....	—	—	—	—	—	—	—	—	—	M	M	—	—	—	—	—
4830.....	M	—	M	M	M	removed.				—	—	—	—	—	—	—
4831.....	—	—	M	—	M	M	M	—	—	M	M	M	S	S	M	M
4836.....	—	—	—	—	—	M	S	—	—	M	—	S	S	—	—	—
4838.....	—	—	—	—	—	—	M	M	—	M	—	—	—	—	—	—
4841.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Per cent., marked craving	20	12	20	16	28	20	20	24	32	24	20	12	12	12	12	12
134.....	M	—	—	—	M	—	—	—	—	—	—	—	—	—	—	—
146.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
166.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
206.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
212.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
213.....	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
246.....	S	S	—	—	—	—	S	—	S	M	S	S	M	M	—	—
247.....	—	—	—	M	—	—	—	—	—	—	—	—	—	—	—	—
259.....	M	M	—	—	—	—	M	M	—	—	—	S	—	—	—	—
268.....	—	—	—	—	—	—	—	—	S	—	—	—	—	—	—	—
3082.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3707.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3873.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4026.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4298.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4340.....	—	—	—	—	M	—	—	—	—	S	—	—	—	—	—	—
4351.....	—	—	—	S	S	S	M	S	M	M	S	S	S	S	S	S
4761.....	—	—	—	M	—	—	S	S	—	—	—	—	—	—	—	—
4827.....	—	—	—	—	—	—	S	M	S	—	S	—	S	—	—	—
4829.....	—	—	M	—	—	—	M	M	M	—	M	—	M	M	M	M
4835.....	—	—	—	—	—	—	M	S	—	—	—	—	S	S	S	M
4837.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4840.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4844.....	—	—	—	—	—	—	S	—	—	S	—	—	S	—	—	—
Per cent., marked craving	12	4	4	8	12	8	12	12	8	12	4	4	8	12	4	8

Experiment ended.

TABLE 16.

Oxen Bought at Vryburg Stock Fair—Bonemeal-feeding.

Date. 1919- 1920.	November.				December.				January.				February.							
	4.	11.	17.	25.	2.	9.	23.	30.	5.	13.	10.	26.	2.	9.	16.	23.				
No. of Animal.				S	S	S	M	S	Each animal now given 16 oz. bonemeal and 8 oz. bran per day.				S	S	S	S				S
292.....													S	S	S	S				
293.....									S	S	S	S								
294.....									S	S	S	S								
295.....									S	S	S	S								
296.....									S	S	S	S								
297.....									S	S	S	S								
298.....									S	S	S	S								
299.....									S	S	S	S								
300.....									S	S	S	S								
301.....									S	S	S	S								
302.....									S	S	S	S								
303.....									S	S	S	S								
304.....									S	S	S	S								
305.....									S	S	S	S								
306.....									S	S	S	S								
207.....									S	S	S	S								
193.....									S	S	S	S								
199.....									S	S	S	S								
204.....									S	S	S	S								
205.....									S	S	S	S								
Per cent. M	0	0	5	5	10	25	30	35	15	10	5				5		0			

TABLE 16—(continued).

Date. 1919-1920.	March.					April.				May.				June.		
	1.	8.	15.	22.	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.
No. of Animal.										M				S	M	S
292.....																
293.....																
294.....																
295.....																
296.....																
297.....																
298.....																
299.....																
300.....																
301.....																
302.....																
303.....																
304.....																
305.....																
306.....																
307.....																
193.....																
199.....																
204.....																
205.....																
Per cent. marked craving.....	0	0	0	0	0	10	20	25	30	25	30	10	10	10	25	10

TABLE 17.

Cattle Kraaled and given a Mixed Ration of 3 lb. of Bran, 1½ lb. Crushed Mealies, 5 lb. Lucerne, 8 oz. of Bonemeal with Pretoria Hay ad libitum.

Date. 1919.	July.					Aug.	Date. 1919.	July.					Aug.
	1.	8.	15.	21.	28.	5.		1.	8.	15.	21.	28.	5.
No. of Animal.				15th, special feeding begun.			No. of animal.				15th, special feeding begun.		
103.....	M	M	M	S	—	—	174.....	M	M	M	S	—	—
109.....	S	S	M	—	—	—	193.....	M	M	M	—	—	—
135.....	M	M	M	—	—	—	198.....	M	M	M	S	M	—
145.....	M	M	M	S	—	—	203.....	M	M	M	M	M	M
157.....	—	M	M	—	—	—	3991.....	S	M	M	—	—	—
158.....	M	M	M	—	—	—	4024.....	M	M	M	S	—	—
161.....	M	M	M	—	—	—	4048.....	M	M	M	M	—	—
162.....	S	M	M	—	—	—	4298.....	M	M	M	S	—	—
165.....	S	M	M	—	S	—	4344.....	M	M	M	—	—	—
167.....	S	M	M	—	—	—	% M.....	70	95	100	10	10	5

TABLE 18.

Comparing Bonemeal, Dissolved Bonemeal, Bone-ash, and Dissolved Bone-ash.

Date. 1919.	Bonemeal.									
	August.					September.				
	5.	11.	1 lb. bonemeal daily.	18.	25.	1.	8.	15.	22.	
No. of Animal.										
2914.....	M	M		M	M	M	M	S	—	
3817.....	M	M		M	S	M	M	S	—	
3902.....	M	M		M	—	—	—	—	—	
4359.....	M	M		S	M	M	—	S	—	
3911.....	S	M		S	—	—	—	—	—	
Percentage M...	80	100		60	40	60	40	0	0	

	Bone Ash.									
	5.	11.	8 oz. bone ash.	18.	25.	1.	8.	15.	22.	
2691.....	M	M			M	M	M	S	M	S
3154.....	S	M		S	—	—	—	—	—	
3232.....	M	M		M	M	M	M	M	—	
3386.....	M	S		—	—	—	—	—	—	
4178.....	M	M		M	M	M	M	M	S	
Percentage M...	80	80		60	60	60	40	60	0	

TABLE 18—(continued).

Date. 1919.		Dissolved Bonemeal (Bone Super).												
		August.					September.					October.		
		5.	11.	1 lb per head per day.	18.	25.	Reduced to 6 oz. per head.	1.	8.	15.	22.	29.	7.	13.
No. of Animal.	M	M	M		M	M		M	M	M	M	S	S	S
3387.....	M	M	M	M	M	M	M	M	—	S	—	—	—	
3866.....	M	M	M	M	ill	ill	—	—	—	—	—	—	—	
3932.....	M	M	M	M	—	—	—	—	—	—	—	—	—	
4533.....	M	M	M	M	—	—	—	—	—	—	—	—	—	
4525.....	M	M	—	—	M	S	—	—	—	—	—	—	—	
Percentage M....	100	100	1 1/3	80	60	40	40	20	20	0	0	0	0	

Date. 1919.		Dissolved Bone-ash.												
		August.					September.					October.		
		5.	11.	1 lb. per head.	18.	25.	Reduced to 4 oz.	1.	8.	15.	22.	29.	7.	13.
No. of Animal.	M	M	S		M	S		M	M	—	S	—	S	—
1149.....	M	M	—	—	S	S	S	—	—	—	S	—	—	
2746.....	M	M	M	M	M	S	S	—	—	—	—	—	—	
3136.....	M	M	M	M	M	M	M	—	—	—	—	—	—	
3617.....	M	M	M	M	M	M	M	M	—	S	—	—	—	
143.....	M	M	S	S	S	ill	—	died	—	—	—	—	—	
Percentage M....	100	100	40	60	20	40	40	0	0	0	0	0	0	

M = Marked osteophagia. S = Slight osteophagia. — = Absence of craving.

TABLE 19.

Date. 1919.		Bone-ash.														
		April.			May.					June.				July.		
		25	1	6	12	19	26	3	12	16	23	1	8	15	21	28
No. of Animal.	M	M	M	M	M	M	M	M	M	M	M	—	—	—	M	
1149.....	M	M	M	—	M	—	S	S	S	—	—	S	—	—	M	
2580.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
2691.....	M	M	M	M	M	M	M	M	M	—	—	M	M	M	M	
2746.....	M	M	M	M	M	M	M	M	—	—	M	M	M	M	M	
3136.....	M	M	M	M	M	M	M	M	S	M	S	M	M	M	M	
3154.....	M	M	M	M	M	M	M	M	M	—	M	S	M	M	M	
3232.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
3386.....	M	M	M	M	M	M	—	—	—	—	—	—	—	—	M	
3617.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	
Percentage M....	100	100	100	90	100	90	80	80	55	55	65	55	65	65	100	

TABLE 19—(continued).

Date. 1919.	Controls to Bone-ash.												
	April. 25	May.					June.				July.		
		6	12	20	27	2	11	16	23	1	8	15	
No. of Animal.													
2632.....	M	M	M	M	M	M	M	M	M	M	M	M	
3159.....	S	M	M	M	M	M	M	M	M	M	M	M	
3306.....	S	M	M	M	M	M	M	M	M	M	M	M	
3331.....	M	M	M	M	M	M	M	M	M	M	M	M	
3381.....	—	M	M	M	M	M	M	S	M	M	M	M	
3473.....	S	M	M	M	M	M	M	M	M	M	M	M	
3620.....	S	M	M	M	M	M	M	M	M	M	M	M	
3673.....	—	M	—	M	—	—	M	S	M	M	M	M	
3819.....	S	M	M	M	M	M	M	M	M	M	M	M	
Percentage M.....	22	100	90	100	90	90	100	80	100	100	100	100	

TABLE 20.

Finely Ground Cinders Supplied.

Date. 1919.	April. 23.	1st April, 8 oz. per head per day.	May.					June.			
			1.	6.	12.	19.	26.	2.	12.	16.	23.
No. of Animal.											
2341.....	S		S	M	M	M	M	M	M	M	M
3297.....	S		S	M	M	M	M	M	M	M	M
3320.....	S		S	—	—	—	—	—	—	—	—
3578.....	S		S	M	M	M	M	M	M	M	M
3909.....	S		S	M	M	M	—	M	M	S	M
4086.....	S		S	M	M	M	M	M	M	M	M
4175.....	S		S	M	M	M	M	M	M	M	M
4187.....	S		S	M	M	M	M	M	M	M	M
4550.....	S		S	M	M	M	M	M	M	M	M
Percentage M.....	0		0	88	88	88	78	88	88	78	88

TABLE 23.
Whale-meal Supplied (8 oz. per Head per Day).

Date. 1919.	June.		July.					August.				September.	
	23.	1.	8.	14.	21.	28.	5.	11.	18.	25.	1.	8.	
No. of Animal.													
2341.....	M	M	M	M	M	S	—	M	S	—	—	S	
3297.....	M	M	M	M	M	M	M	M	M	M	—	—	
3578.....	M	M	M	M	M	M	M	M	S	S	S	S	
4175.....	M	M	M	M	M	M	M	—	M	—	S	—	
4187.....	M	M	M	M	M	M	M	M	M	M	M	M	
4103.....	M	M	M	S	S	S	S	S	—	S	S	—	
4322.....	M	M	M	M	M	M	M	M	M	S	—	—	
4323.....	M	—	—	—	—	—	—	—	—	—	—	—	
4339.....	M	M	M	M	S	S	—	—	—	—	—	—	
4361.....	M	M	M	S	—	—	—	S	S	S	S	S	
Percentage M.....	100	90	90	70	60	50	50	50	40	20	10	10	

TABLE 24.
10 gm. of Potassium Carbonate, 5 lb. Maize-meal per Head per Day.

Date. 1919-1920.	November.					December.					Jan.
	3.	10.	17.	24.	10 gm. Potassium carbonate.	1.	8.	15.	22.	29.	5.
No. of Animal.											
3307.....	—	S	S	—	S	S	S	M	M	M	M
3349.....	—	—	—	—	S	S	S	S	M	M	M
3365.....	—	—	—	—	—	—	S	S	M	S	S
3398.....	M	—	S	—	M	S	M	M	M	M	M
4190.....	M	M	M	—	M	M	M	M	M	M	M
1188.....	—	—	—	—	—	—	—	—	S	S	—
Percentage M.....	33	16	16	33	16	33	50	83	67	67	

TABLE 25.
Sulphate of Iron Supplied (Mixed with a little Maize-meal).

Date. 1919-1920.	Dec.		January.				February.				March.			
	30.	6.	13.	20.		26.	2.	9.	16.	23.	1.	8.	15.	22.
No. of Animal.	S	—	M	S		M	M	M	M	S	M	M	M	M
207.....	—	S	M	M		M	M	S	S	—	M	M	M	M
238.....	S	S	M	S		M	M	M	M	S	M	M	M	M
257.....	—	—	M	M		M	M	M	S	—	—	S	S	S
3318.....	S	S	M	S		M	M	M	M	M	M	M	M	M
3904.....	—	—	M	S		M	M	M	M	—	—	S	S	S
3911.....	M	S	M	S		M	M	M	M	S	M	S	S	S
3933.....	—	S	S	S		S	—	S	—	—	—	—	S	M
4095.....	M	—	S	M		M	M	M	M	S	M	M	M	—
4178.....	—	—	M	M		M	M	M	M	M	M	M	Die ^d	(M)
4542.....	S	S	S	S		S	M	M	M	M	M	M	M	M
Percentage M...	20	0	70	40		80	80	80	70	30	80	70	70	70

TABLE 26.
Calcium Hydroxide (with Oil).

Date. 1919-1920.	December.				January.				February.				Mar.	
	8.	15.	22.	29.	5.		12.	19.	26.	2.	9.	16.	23.	1.
No. of Animal.	M	M	M	M	M		M	M	M	M	M	M	M	M
3410.....	M	M	M	M	M		S	M	M	M	M	M	M	M
3718.....	M	M	M	M	S		S	S	M	S	S	S	S	M
3604.....	M	M	M	M	M		M	M	M	M	M	M	M	M
4051.....	M	M	M	M	M		M	M	M	M	M	M	M	M
4532.....	M	M	M	M	M		M	M	M	M	M	M	M	M
159.....	M	M	M	M	M		S	M	M	M	M	M	M	M
160.....	M	M	M	M	M		M	M	M	M	M	M	M	M
180.....	M	M	M	M	S		M	M	M	S	S	M	M	M
200.....	M	M	M	M	M		M	M	M	M	S	M	M	M
217.....	M	M	M	M	S		S	M	M	M	S	M	M	M
Percentage M...	100	100	100	100	70		60	90	100	80	60	90	90	100

TABLE 27.
Magnesium Sulphate.

Date.	April			May				June			
	12.	19.	26.	3.		10.	17.	24.	1.	7.	14.
No. of Animal.					1 oz. supplied per head per day.						
125.....	M	M	—	S		M	M	M	M	M	M
254.....	S	M	M	M		M	M	M	M	M	M
938.....	M	M	M	M		M	M	M	M	M	M
2581.....	S	M	M	M		M	M	M	M	M	M
3255.....	S	M	S	M		M	M	M	M	M	M
3596.....	S	M	M	M		M	M	M	M	M	M
3990.....	—	M	M	M		S	M	M	M	M	M
4364.....	M	M	M	M		M	M	M	M	M	M
4398.....	M	M	M	M		M	M	M	M	M	M
4402.....	M	M	M	M		M	M	M	M	M	M
Percentage M...	50	100	80	90		90	100	100	100	100	100

TABLE 28.
Cattle dosed with $\frac{1}{2}$ oz. to 1 oz. of Sulphur Flour per Head per Day.

Date.	Dec.	January.					February.					March.		
	1919-1920.	30.	6.	13.	20.	26.	2.	9.		16.	23.	1.	8.	15.
No. of Animal.														
105.....	S	M	M	M	M	M	M	M	M	M	M	M	M	M
211.....	S	M	S	M	M	M	M	M	M	M	M	M	M	M
228.....	—	M	M	S	M	M	M	M	M	S	M	M	M	M
2431.....	S	M	M	M	M	M	M	M	M	M	M	M	M	M
2707.....	—	—	S	S	M	M	M	M	M	S	M	M	M	M
2724.....	M	—	M	M	M	M	—	—	M	M	M	M	M	M
3383.....	S	M	M	M	S	M	M	—	—	—	—	S	S	S
3486.....	S	S	M	M	M	M	S	S	—	—	S	S	S	M
3600.....	S	S	M	S	M	M	S	S	M	S	M	M	M	M
3872.....	M	M	M	M	M	—	M	M	S	M	M	M	M	M
Percentage M.	20	60	80	70	70	90	60		70		80	80	90	

TABLE 29.

Cattle dosed with 1/2 gm. of Arsenite of Soda per Head per Day.

Date 1919-1920.	December.			January.				February.				March.
	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.
No. of Animal.												
157.....	M	S	M	S	S	S	—	S	S	S	—	M
158.....	M	S	M	M	S	M	S	S	S	S	—	—
3807.....	M	M	M	M	M	M	M	M	S	S	S	M
3849.....	S	M	M	M	S	M	S	S	S	M	M	M
3898.....	M	M	M	M	M	M	M	M	M	M	M	M
4048.....	M	M	M	M	M	M	M	M	M	M	M	M
4103.....	M	M	M	M	M	M	M	M	S	M	M	M
4190.....	M	M	M	M	M	M	M	M	M	M	M	M
4322.....	M	M	M	M	M	M	M	M	S	S	M	M
4357.....	M	M	M	M	M	M	M	M	M	M	M	M
Percentage M...	90	80	100	90	70	80	70	70	40	60	70	90

TABLE 30.

Cattle given One Subcutaneous Injection of 1/2 gm. Elementary Phosphorus Dissolved in 50 c.c. of Oil.

Date. 1920.	December.			January.				February.		
	15.	22.	29.	5.	12.	19.	26.	2.	9.	17.
No. of Animal.										
170.....	M	M	M	M		Exit.				
2598.....	S	M	M	M		S	S	M	S	S
2859.....	M	M	M	M		M	M	M	M	M
2914.....	M	M	M	M		M	M	M	M	M
2994.....	M	M	M	M		Ill.	Transferred.			
3168.....	M	M	M	M		M	M	M	M	M
3371.....	S	M	M	M		M	S	M	M	M
3386.....	M	M	M	M		S	M	M	M	M
3866.....	M	M	M	M		Exit.				
4525.....	M	M	M	M		M	M	M	S	M

TABLE 31.

Phosphoric Acid in Drinking-water.

LOT I.—1.6 c.c. per 1,000; i.e. approximately 20 c.c. per Head per Day.

Date.	Sept.		October.				November.				December.				
	22.	30.	6.	13.	20.	27.	3.	10.	17.	24.	1.	8.	15.	22.	29.
1919.															
No. of Animal.															
168	—	—	S	—	—	—	—	—	—	—	S	M	M	M	M
196	—	—	—	—	—	—	—	—	—	—	—	—	—	S	M
251	M	S	M	—	—	—	—	—	—	S	S	—	M	M	M
2907	S	S	M	S	S	S	S	—	—	—	S	M	M	Transf.	—
3578	—	M	M	S	S	—	Exit.	—	—	—	—	—	—	—	—
3583	—	M	M	—	M	—	—	—	—	—	S	M	M	Transf.	—
4024	—	—	S	—	S	—	—	—	—	S	S	M	M	Transf.	—
4101	—	—	M	—	S	S	—	—	—	S	M	M	M	Transf.	—
4106	—	—	—	S	M	M	M	—	—	—	M	M	—	M	M
4530	M	M	S	S	M	S	—	—	—	S	M	M	M	Transf.	—
% M.	20	30	50	0	30	10	10	0	0	11	33	77	77	88	100

NOTE.—This table is of little value since the variation in osteophagia noted happens to coincide with the natural variation due to the vegetation.

TABLE 32.

Phosphoric Acid in Drinking-water.

LOT II.—1 c.c. per litre of Water; i.e. approximately 20 c.c. per Head per Day.

Date.	Sept.		October.				November.				December.				
	22.	30.	6.	13.	20.	27.	3.	10.	17.	24.	1.	8.	15.	22.	29.
1919.															
No. of Animal.															
126	—	M	S	M	S	S	—	—	—	—	—	—	S	S	S
957	—	S	M	M	S	S	—	—	—	S	—	—	S	M	M
1937	—	S	S	S	S	S	S	—	—	S	S	M	M	Transf.	—
2571	—	S	M	S	—	—	S	—	—	—	S	M	M	M	M
3221	—	S	M	S	S	—	—	—	—	—	S	S	S	M	M
3247	—	M	S	S	S	—	S	—	—	—	—	—	M	M	M
3318	—	S	S	S	S	S	S	—	—	—	—	—	S	M	S
3406	—	S	S	M	S	S	S	—	S	S	S	M	M	M	M
3601	—	S	M	M	S	S	S	—	—	—	—	S	S	M	M
3778	—	M	S	M	S	M	S	—	—	S	M	M	M	Transf.	—
4244	—	S	M	M	S	S	S	—	S	M	M	M	M	Transf.	—
4351	—	M	S	M	S	S	S	—	—	—	S	M	M	M	M
Percent. M.	0	33	42	58	0	8	0	0	0	8	16	50	58	92	83

NOTE.—This table is of little value since the variation in osteophagia noted happens to coincide with the natural variation due to the pasture.

TABLE 33.
Administration of Sodium Phosphate in Varying Amounts.

Date. 1919-1920.	Aug.		September.					October.				November.				December.				January.				February.				
	25.	1.	8.	15.	22.	29.	7.	13.	20.	27.	3.	10.	17.	24.	1.	8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	
No. of Animal.																												
106.....	S	S	M	M	M	M	S	S	S	—	—	—	—	S	M	—	M	M	M	—	M	—	—	—	—	—	—	
141.....	M	M	M	—	—	—	S	M	—	—	—	—	—	M	M	S	S	S	S	M	—	—	—	—	—	—	—	
154.....	M	M	S	—	—	—	S	S	—	—	—	—	—	—	—	—	—	—	—	M	—	—	—	—	—	—	—	
3597.....	M	M	M	12th, 100 gm. given.	16th, increased to 200 gm.	—	S	M	M	S	—	—	—	—	S	M	M	M	M	M	—	—	—	—	—	—	—	
3811.....	M	M	—	—	—	—	S	S	—	—	—	—	—	S	S	S	S	S	M	—	—	—	—	—	—	—	—	
4537.....	M	S	S	—	—	—	S	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Percent. M.....	83	67	50	50	50	50	17	34	50	17	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2371.....	—	—	—	—	—	M	M	M	—	M	S	S	—	S	M	M	M	M	M	M	—	S	M	M	S	S	S	
3333.....	—	—	—	—	—	—	M	M	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3716.....	—	—	—	—	—	M	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
3842.....	—	—	—	M	Not dosed.	M	M	M	—	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Percent. M.....	—	—	—	25	75	100	100	80 gm. dosed.	25	75	25	0	11th, dosing discontinued with all ten.	0	30	40	80	60	70	80	70	7th, dose raised to 6 oz.	40	20	10	0	0	

TABLE 34.

Cattle dosed with Varying Amounts of Pure Calcium Phosphate.

Date. 1919- 1920.	December.				January.				February.				March.					
	8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.	9.				
No. of Animal.					Dosed with 5 oz. of calcium phosphate.													
253	M	M	M	M	M	S	S	S	M	S	—	—	—	—	—			
260	M	M	M	M	M	—	—	—	M	M	—	—	—	—	—			
263	M	M	M	M	M	—	—	—	M	M	—	—	S	—	—			
264	M	M	M	M	M	S	—	—	M	M	M	—	—	—	—			
3595	M	M	M	M	S	S	—	—	—	—	—	—	—	—	—			
% M.									20	80	40	0	0	0	0			
4141	M	M	M	M	M	M	—	—	S	M	M	M	M	—	—			
4177	M	M	M	M	S	—	—	—	—	—	—	—	—	—	—			
173	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—			
175	M	M	M	M	—	—	—	—	—	—	—	—	—	—	—			
198	M	M	M	M	M	S	—	—	S	—	S	S	S	—	—			
% M.	100	100	100	100	60	10	0	5	0	10	10	10	10	0	0			

TABLE 35.

Administration of 4 oz. of Pure Calcium Phosphate per Head per Day.

Date 1919- 1920.	Nov.		December.				January.				February.				Mar.				
	17.	24.	1.	8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.			
No. of Animal.						Calcium phosphate, 4 oz. begun.													
227	M	M	M	M	M	M	S	S	S	—	—	—	—	—	—	—			
1937	—	S	S	S	M	M	M	S	—	—	—	—	—	—	—	—			
2907	—	S	S	S	—	M	M	S	—	—	—	—	—	—	—	—			
3154	S	M	S	M	M	S	S	S	S	—	—	—	—	—	—	—			
3583	—	—	S	M	M	M	S	—	S	—	—	—	—	—	—	—			
% M.																			
3778	—	S	M	M	M	M	M	M	S	—	—	—	—	—	—	—			
4024	—	S	S	M	M	M	S	—	—	—	—	—	—	—	—	—			
4101	—	S	M	M	M	M	M	S	—	—	—	—	—	—	—	—			
4244	S	M	M	M	M	M	S	S	S	—	—	—	—	—	—	—			
4530	—	S	M	M	M	S	S	S	S	—	—	—	—	—	—	—			
% M.	10	30	50	90	100	70	30	10	0	0	5	20	20	0	20	20			

TABLE 36.
Phosphoric Acid Administration.
LOT III.—In drinking-water.

Date. 1919-20.	November.			December.					January.			February.				March.				
	11.	17.	25.	1.	8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.	9.	16.	
No. of Animal.				Phos. acid 1 per 1,000 in drinking water.			17th phos. acid equiv. to 12 c.c. per head.					7th phos. acid equiv. to 25 c.c. per head.						Phos. acid discontinued, 29th.		
111	S	M	S	S	M	M	S	M	S	S	S	S	S	S	S	S	S	M	S	
261																				
2314	S	S	S	S	M	M	S	M	S	S	S	S	S	S	S	S	S	M	S	
2341	S	S	S	S	M	M	S	M	S	S	S	S	S	S	S	S	S	M	S	
2581	S	M	M	M	S	M	M	M	S	S	S	S	S	S	S	S	S	M	S	
3255	S	M	M	M	S	M	M	M	S	S	S	S	S	S	S	S	S	M	S	
3596	S	M	M	M	S	M	M	M	S	S	S	S	S	S	S	S	S	M	S	
3902	S	M	M	M	S	M	M	M	S	S	S	S	S	S	S	S	S	M	S	
3991	S	M	M	M	S	M	M	M	S	S	S	S	S	S	S	S	S	M	S	
4364	S	M	M	M	S	M	M	M	S	S	S	S	S	S	S	S	S	M	S	
% M.	0	40	50	40	40	60	60	40	30	0	0	0	0	?	0	0	0	40	60	

LOT IV.—Mixed with Maize-meal as a Paste.

Date— 1919-1920.	December.			January.					February.				March.		
	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.	9.	16.	
No. of Animal.	17th, phos. acid equiv. to 25 c.c. per head.			Phos. acid 20 c.c. in 1 oz. maize-meal.					29th, phos. acid discontinued.						
4098	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
113	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
116	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
215	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
2404	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
2634	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
2636	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
3255	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
3596	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
3902	M	M	M	S	M	M	M	S	M	M	M	S	M	M	
Percent. M.	90	90	80	80	30	20	30	30	0	0	0	0	60	60	

TABLE 37.
Phosphoric Acid, 30 c.c. per Head per Day; Mixed with Maize as a Paste.

Date. 1919.	May.				June.				July.			
	7.	14.	21.	29.	4.	11.	18.	25.	2.	9.		
No. of Animal.	Commenced 3rd May.										Discontinued.	
3799	M	—	M	—	—	—	—	—	—	—	—	
3901	M	M	M	—	M	M	S	—	—	—	—	
3904	—	—	—	—	—	—	—	—	—	—	—	
4104	—	M	—	—	—	—	—	—	—	—	—	
4349	—	M	M	M	M	M	M	—	—	—	—	
4529	M	M	M	M	M	M	M	—	—	—	—	
4550	M	M	M	M	M	M	M	—	—	—	—	
Percentage M.	70	70	70	43	57	57	43	0	0	0	0	

TABLE 38.
*Hydrochloric Acid (Lots I and II) and Nitric Acid (Lot III) given
in Drinking-water.*

Lot I.—HCl, 1 in 5,000.														Lot II.—1 per 1,000.																						
Date. 1919.	Sep. 29.	October.					November.				December.					Date. 1919-1920.	November.				December.					Jan. 5.										
		6.	13.	20.	27.	3.	10.	17.	24.	1.	8.	15.	22.	29.	3.		10.	17.	24.	1.	8.	15.	22.	29.												
No. of Animal.															No. of Animal.																					
157.....	S	M	S	—	—	—	—	—	S	S	M	M	S	M	1743.....	M	M	M	M	M	Exi.t.															
158.....	S	M	S	S	—	—	—	—	S	S	S	M	S	M	3410.....	M	S	M	M	M	M	M	M	M	M	M	M	M								
173.....	S	S	S	S	S	—	—	—	—	S	M	M	M	M	3718.....	—	M	M	M	M	M	M	M	M	M	M	M	M								
175.....	S	S	S	S	S	—	—	—	—	S	S	M	M	M	3864.....	—	—	S	S	S	S	S	S	S	S	S	S	S								
198.....	S	M	S	S	S	S	—	—	S	S	M	M	M	M	4004.....	S	—	S	—	M	—	S	S	M	S	M	S	M								
3806.....	S	S	S	S	S	S	—	—	S	M	S	M	S	M	4187.....	S	S	S	M	S	M	—	M	M	M	M	M	M								
4048.....	S	S	S	S	S	S	S	—	S	S	M	M	M	M	3604.....	S	S	S	—	S	M	M	M	M	M	M	M	M								
4103.....	S	S	S	—	S	S	—	—	S	M	M	M	M	M	4051.....	S	S	S	S	M	M	M	M	M	M	M	M	M								
4322.....	S	S	S	—	S	—	—	—	S	S	M	M	M	M	4532.....	S	M	M	M	M	M	M	M	M	M	M	M	M	M							
4357.....	S	M	S	S	S	M	—	S	M	M	M	M	M	M	159.....	S	S	S	S	M	M	M	M	M	M	M	M	M	M							
Percent. M.	0	40	0	0	0	10	0	0	10	40	80	100	70	100	180.....	—	S	M	S	M	M	M	M	M	M	M	M	M	M							
Lot III.																																				
No. of Animal.	Dec. 30.	January.					February.				March.			200.....	217.....	253.....	260.....	263.....	264.....	2667.....	3595.....	4090.....	4141.....	4177.....	4344.....	Percent. M										
		6.	13.	20.	22nd. Experiment commenced Jan. 10 c.c. nitric acid in 10 litres of water.	26.	2.	9.	16.	22.	1.	8.	15.														S	S	S	S	S	S	S	S	S	S
124.....	M	S	M	M			M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
125.....	—	S	M	M		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
139.....	M	S	M	M		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
236.....	M	S	M	M		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
245.....	M	—	M	M		M	M	—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3867.....	M	M	M	M		S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4229.....	—	S	M	M		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4323.....	M	S	M	M		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4523.....	M	—	M	M		S	M	S	S	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4544.....	—	M	M	M		—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

TABLE 39.

Ten Cattle on 4 oz. Ground Rock Phosphate (Imported) per Head per Day.

Dosing commenced 18th February.

Date.	Jan.	February.				March.					April.				May.				June.		
	26.	2.	9.	17.	23.	1.	8.	15.	22.	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.
1920.																					
No. of Animal.																					
1149	M	M	M	M	—	S	—	—	—	S	S	M	M	M	M	M	M	M	M	M	M
2859	M	M	M	M	M	—	—	S	—	—	S	S	S	M	M	M	M	M	M	M	M
2914	M	M	M	M	M	M	S	M	S	S	S	M	M	M	M	M	M	M	M	M	M
3168	M	M	M	M	M	—	—	—	—	—	—	—	—	—	S	—	S	S	—	—	S
3371	S	S	M	M	—	—	—	S	—	—	M	M	—	S	M	S	—	—	—	—	—
3386	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4525	M	M	S	M	—	M	S	S	M	M	—	—	—	—	—	—	—	—	S	—	M
4528	—	M	M	M	—	—	S	—	M	M	—	—	—	—	—	—	—	—	M	—	S
4546	M	M	M	M	M	M	M	M	M	M	S	M	M	S	M	M	M	S	S	M	M
4728	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Per cent. M	80	90	90	100	60	50	30	40	50	50	30	60	50	40	70	60	60	50	60	60	70

NOTE.—M = marked craving ; S = slight craving ; — = absence of craving.

TABLE 40.

Ten Cattle Fed on Saldanha Bay Phosphate and Ten upon the same Phosphate "Rendered Soluble in Citric Acid."

Cattle Fed on 5 oz. Saldanha Bay Phosphate per Head per Day.

Date. 1920.	Mar.	April.				May.					June.		
	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.	
No. of Animal.													5 oz. rock phosphate per head per day.
100.....	M	—	M	M	S	M	—	S	—	S	M	M	
152.....	M	M	M	M	M	M	M	M	M	M	M	M	
3800.....	M	M	M	M	M	M	M	M	M	M	M	M	
3865.....	S	S	S	M	M	M	M	M	M	M	M	M	
4439.....	M	M	M	M	M	M	M	M	M	M	M	M	
4516.....	M	M	M	M	S	M	M	M	M	M	M	M	
4548.....	M	M	M	M	M	S	M	M	M	M	M	M	
4690.....	M	M	M	M	M	M	M	M	M	M	M	M	
4734.....	S	M	M	M	M	M	M	M	M	M	M	M	
4753.....	M	—	M	M	M	M	M	M	M	M	M	M	
Percentage M...	80	70	90	100	80	90	90	90	90	90	100	100	

Cattle Fed on 5 oz. of 16 per cent. Basic Phosphate per Head per Day.

No. of Animal.					5 oz. basic phosphate per head.							
148.....	M	M	S	M		S	S	M	M	—	S	—
3770.....	M	M	M	M	M	M	M	M	—	—	—	—
3817.....	M	M	M	M	M	M	M	M	S	M	M	S
3875.....	M	M	M	M	M	M	M	M	S	M	M	—
4328.....	—	—	M	M	M	M	M	S	S	S	S	S
4339.....	S	S	S	S	S	S	—	S	—	—	—	—
4696.....	M	M	M	M	M	M	M	S	S	S	—	S
4819.....	S	S	S	M	M	M	S	S	S	S	S	S
4832.....	M	M	M	M	M	M	M	M	M	S	M	M
4443.....	M	M	—	M	M	S	M	—	—	—	—	M
Percentage M...	70	70	60	90	80	70	80	50	20	20	30	20

NOTE.—M = marked osteophagia; S = slight osteophagia; — = absence of osteophagia.

TABLE 41.
2 lb. Wheaten Bran per Head per Day.

Date. 1919.	July.			August.				September.											
	15.	21.	28.	5.	11.	18.	25.	1.	8.										
No. of Animal.	Bran-feeding commenced.																		
2404.....											M	M	M	M	M	M	M	M	M
2598.....											M	M	—	—	—	—	Discontinue	d.	—
3082.....											—	S	—	—	—	—	Discontinue	d.	—
4226.....											M	M	M	M	M	S	—	—	—
4526.....											M	M	M	M	M	M	M	M	M
3842.....											M	M	M	M	M	M	S	—	—
3843.....											M	M	M	—	S	—	Discontinue	d.	—
2571.....											M	M	M	M	M	S	S	M	—
2581.....											—	M	M	—	—	—	Discontinue	d.	—
2620.....	—	—	—	—	—	—	Discontinue	d.	—										
Percentage M	70	80	70	50	50	30	20	30	20										

TABLE 42.
Bran-feeding.—Moderate Ration of 2 lb. of Wheaten Bran per Head per Day Fed to Grazing Cattle.
LOT I.—Cattle.

Date. 1919-1920	November.			December.				January.				February.			Mar.																						
	10.	17.	24.	1.	8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.																				
No. of Animal.	Previous ration stopped.										Bran-feeding begun.																										
2642....																					—	—	—	S	M	M	M	S	M	M	S	S	S	S	—	S	M
3802....																					—	—	—	S	—	S	S	M	M	—	S	—	—	—	—	—	—
3857....																					—	S	M	M	M	M	M	M	S	M	M	M	—	—	—	Discontinued.	M
3993....																					—	—	—	S	M	M	M	M	M	M	—	—	—	—	—	—	M
4534....	—	—	S	S	S	M	M	S	S	S	S	S	—	—	—	—	S																				
Per cent. M	0	0	20	20	60	80	80	80	80	40	40	20	20	0	0	20	40																				

LOT II.—Calves.

No. of Animal.	Ration stopped.										Bran commenced.																										
4329....																					—	—	—	—	M	M	S	S	—	—	—	—	—	—	—	—	—
4353....																					—	—	—	—	M	M	M	S	M	—	—	—	—	—	—	—	—
4363....																					—	—	S	—	S	M	M	—	S	—	—	—	—	—	—	—	—
4435....																					—	—	—	—	M	M	M	—	—	S	—	—	—	—	—	—	—
4453....																					—	—	S	—	M	M	M	—	—	—	—	—	—	—	—	—	—
4520....	—	—	S	—	M	M	M	—	—	—	—	—	—	—	—	—	—																				
Per cent. M	0	0	0	50	100	83	33	67	17	17	17	17	17	17	0	0	0																				

TABLE 43.

Wheaten Bran fed to Grazing Cattle.—Commenced with 9 oz. per Head per Day later raised to 2 lb. ; then discontinued.

Date.	Sept.		October.				November.				December.				January.			February.			March.					
	23.	30.	6.	13.	20.	27.	3.	10.	17.	24.	1.	8.	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.	16.	
1919-1920.																										
No. of Animal.				9 oz. per day per head from 9th.													On 7th ration increased to 2 lb.									
103.....	—	—	—	—	S	—	—	—	—	—	—	—	—	S	—	—	—	—	—	—	—	—	—	—	—	—
109.....	—	—	S	S	S	—	—	—	—	S	S	M	M	S	M	—	—	M	M	S	S	—	—	—	—	—
123.....	—	M	M	S	M	M	S	M	M	M	—	M	M	M	M	—	M	M	M	M	M	S	—	—	—	—
135.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S	S	S	S	S	—	—	—	—	—
167.....	—	—	S	S	S	S	—	S	S	S	S	M	S	M	M	—	S	S	S	S	—	—	—	—	—	—
3611.....	M	M	M	M	M	M	—	—	M	M	M	M	M	M	M	—	M	M	M	M	—	—	—	—	—	—
3821.....	S	M	M	S	M	S	—	—	—	—	—	—	—	S	S	—	—	—	—	—	—	—	—	—	—	—
3876.....	—	M	M	M	M	S	S	—	—	—	S	S	M	M	M	—	—	M	M	M	S	—	—	—	—	—
3990.....	—	—	M	M	M	S	S	S	S	S	S	M	S	M	M	—	M	M	S	M	S	—	—	—	—	—
4175.....	—	M	M	S	S	—	S	—	—	S	M	S	S	M	M	—	M	M	M	M	S	—	—	—	—	—
Percentage M.	10	50	60	30	40	20	0	10	20	20	20	50	40	60	60	80	50	60	50	60	10	0	20	10	70	

TABLE 44.

Bran Feeding.—High ration. 4 lb. Wheaten Bran per head per day.

Date.	May.		June.				July.				August.				Sept.		
	19.	26.	2.	11.	16.	23.	1.	8.	15.	21.	28.	5.	11.	18.	25.	1.	8.
1919.	4 lb. wheaten bran per head per day.																
No. of Animal.	Bran feeding discontinued.																
100.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
104.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
108.....	M	—	—	—	—	S	S	S	—	—	—	—	—	—	—	—	
137.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
173.....	M	—	—	M	—	—	—	—	—	—	S	M	S	M	S	—	
175.....	M	—	—	—	—	—	—	—	—	—	—	S	—	—	—	—	
3801.....	M	—	M	S	S	—	—	—	—	—	S	M	M	M	S	S	
4362.....	M	M	—	S	S	—	—	—	—	—	S	M	M	M	M	M	
4544.....	M	M	M	—	—	—	—	—	—	—	M	S	—	—	—	—	
4244.....	M	—	—	—	—	—	—	—	—	—	—	S	M	M	—	M	
3806.....	M	—	S	—	S	—	—	—	—	—	M	M	M	—	S	S	
Percentage M.	4	73	18	18	9	0	0	0	0	27	45	36	64	45	27	9	36

TABLE 44—(continued).

Date.	June.		July.				August.				Sept.		
	16.	23.	1.	8.	15.	21.	28.	5.	11.	18.	25.	1.	8.
1919.	On 23rd, 4 lb. wheaten bran per head.												
No. of Animal.	Bran feeding discontinued.												
123.....	M	M	M	M	M	M	M	M	M	—	—	—	—
140.....	M	M	M	M	S	M	S	M	M	M	—	—	—
170.....	M	M	M	M	M	M	S	M	—	—	—	—	—
176.....	M	M	M	M	M	M	M	M	—	M	—	—	S
2724.....	M	M	M	S	S	S	—	—	—	—	—	—	—
2947.....	M	M	M	S	S	M	M	M	—	—	—	—	M
3333.....	M	S	S	S	S	S	—	—	—	—	—	—	M
3380.....	M	M	S	S	—	—	—	—	—	—	—	—	M
3583.....	M	M	S	S	—	M	M	M	—	—	—	—	M
3877.....	M	M	—	—	—	—	—	—	—	—	—	—	—
Percentage M.	100	90	60	40	40	60	40	60	30	20	0	20	40

TABLE 45.

Feeding with Maize Bran, low in Phosphorus content, for comparison with Phosphorus-rich Wheat Bran.

Date.	December.				January.				February.			March.				
	15.	22.	29.	5.	12.	19.	26.	2.	9.	16.	23.	1.	8.	15.		
1919-1920.																
No. of Animal.																
136.....	M	M	M	M	M	M	M	M	M	M	M	M	M	S		
140.....	M	M	S	M	M	S	S	S	S	M	M	M	M	M		
254.....	—	M	M	M	M	M	M	M	S	—	S	S	—	S		
938.....	S	M	M	M	M	S	S	—	—	—	—	—	—	—		
2646.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M		
2648.....	M	M	M	M	M	M	M	M	S	S	M	M	M	M		
2889.....	M	M	M	M	M	S	S	M	M	M	M	M	M	M		
2892.....	M	M	S	M	M	M	M	M	M	—	—	—	—	M		
3059.....	M	M	M	M	M	S	M	M	S	M	M	M	S	M		
4822.....	—	M	M	M	M	M	M	M	S	M	M	M	M	M		
Percentage M...	70	100	80	100	5 lb. maize bran given.	80	70	80	80	5 lb., but sample different.	30	60	70	70	60	60

TABLE 46.

Spineless Cactus ad libitum to Grazing Cattle.

LOT I.

Date.	May.			June.			
	9.	20.	27.	2.	11.	17.	23.
1919.							
No. of Animal.							
123.....	M	M	M	M	M	M	M
140.....	M	M	M	M	M	M	M
170.....	M	M	—	M	M	M	M
176.....	M	M	M	M	M	M	M
2724.....	M	M	M	M	M	M	M
2947.....	M	M	M	M	M	M	M
3380.....	M	M	M	M	M	M	M
3901.....	M	M	M	M	M	M	M
4343.....	M	M	M	M	M	M	M
Percentage M.....	100	100	90	100	100	100	100

Armoedsvlakte Cattle.

TABLE 46—(continued).

Lot II.

Date.	June.		July.					Aug.
	1919.	23.	1.	8.	15.	21.	28.	5.
No. of Animal	Feeding commenced.							
193.....		S	M	M	M	M	M	M
194.....		—	—	—	—	—	S	—
195.....		—	—	—	—	—	—	—
196.....		—	—	—	S	M	M	M
197.....		—	—	—	—	—	—	—
198.....		S	M	M	M	M	M	M
199.....		—	—	—	S	M	M	M
200.....		S	M	M	M	M	M	M
201.....		—	—	—	—	—	—	—
202.....		—	—	—	—	—	—	—
Percentage M.....	0	30	30	50	50	50	50	

Mixed Cattle.

TABLE 46—(continued).

Lot III.

Date.	June.			July.				August.		
	1919.	23.	1.	8.	15.	21.	28.	5.	11.	18.
No. of Animal	Feeding commenced.									
189.....		—	—	—	S	S	M	M	M	M
190.....		—	—	—	M	M	M	S	M	M
191.....		—	—	—	—	—	—	—	—	M
192.....		—	—	—	—	—	—	—	—	—
204.....		—	—	—	—	—	—	—	—	—
205.....		—	—	—	—	—	—	—	—	—
206.....		—	—	—	—	—	—	—	—	—
207.....		—	—	—	—	—	—	—	—	—
208.....		—	—	—	—	—	—	—	—	—
210.....		—	—	—	—	—	M	M	—	M
Percentage M.....	0	0	0	10	10	30	20	20	40	

Cattle received from Johannesburg.

TABLE 47.
Feeding with Maize at the Rate of 3 lb. per Head per Day.
LOT I. Maize-meal.

Date.	May.			June.				July.				
	1919.	20.	27.	2.	11.	17.	23.	1.	8.	15.	21.	28.
No. of Animal.	3 lb. maize-meal per head on 15th.											
2642.....	M	M	M	M	M	M	M	M	M	M	M	M
3802.....	M	—	M	M	S	M	M	M	M	M	M	M
3807.....	M	M	M	M	M	M	M	M	M	M	M	M
3812.....	M	M	M	M	M	M	M	M	M	M	M	M
3821.....	M	M	M	M	M	S	—	S	—	—	—	—
3849.....	M	M	M	M	S	S	S	S	S	—	—	—
3857.....	M	M	M	M	M	M	M	M	M	M	M	M
3865.....	M	M	M	M	M	M	M	M	M	M	M	M
3898.....	M	M	M	M	M	M	M	M	M	M	M	M
4190.....	M	M	M	M	M	M	M	M	M	M	M	M
Percent. M....	100	90	100	100	80	80	80	80	80	80	100	90

TABLE 47—(continued).
LOT II. Crushed Maize.

Date.	May.			June.				July.				Aug.			
	1919.	15.	19.	27.	2.	11.	17.	23.	1.	8.	15.	21.	28.	5.	11.
No. of Animal.	3 lb. crushed maize from 16th.														
938.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
1937.....	S	—	—	—	—	—	—	—	S	M	—	—	—	—	—
2994.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3221.....	S	—	—	—	M	S	—	S	—	S	—	—	—	—	—
3247.....	M	M	—	—	M	S	S	S	S	S	—	—	—	—	—
3406.....	M	M	M	M	M	M	M	M	M	M	—	—	—	—	—
3601.....	S	—	—	M	M	—	—	—	—	—	—	—	—	—	—
3841.....	S	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3842.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3843.....	S	—	—	—	—	M	M	M	M	M	—	—	—	—	—
Percent. M.....	40	40	30	40	60	40	40	40	40	40	50	40	70	80	80

TABLE 48.
Grazing Cattle on 5 lb. Maize-meal per Head per Day.

Date.	Aug.		September.				October.				November.				
	25.	1.		8.	15.	22.	30.		6.	13.	20.	27.	3.	10.	17.
No. of Animal.			Commenced.					Change of testing bones.							
3807.....	M	S		S	M	S	M		S	S	S	S	—	S	S
3849.....	S	S		S	—	—	—		—	S	S	—	—	—	—
3865.....	S	S		M	S	—	—		—	S	S	—	S	—	—
4190....	M	M		M	M	M	M		M	M	M	M	M	M	M
3898.....	M	M		S	M	S	M		M	M	M	M	M	M	M
1188.....	S	—	—	—	—	—	—	—	—	S	—	—	—		
Percent. M..	50	33		33	50	17	50		33	33	33	33	33	17	17

NOTE.—On 30th October, the bones used for testing "mild craving" were changed from "sterilized old bones" to "sterilized bleached bones." This affects S, but not M. (See text.)

TABLE 49.
Bean-meal Ration—2 lb. per Head per Day.

Date.	July.	August.				September.					Oct.	
	28.	5.	11.	18.		25.	1.	8.	15.	22.	30.	6.
No. of Animal.												
2646.....	M	M	M	S	20th August, 2 lb. per Head.	—	—	—	S	M	S	S
3596.....	M	M	M	M		M	M	M	S	—	S	M
3707.....	—	M	M	M		—	—	—	—	—	—	—
3874.....	—	M	S	M		—	—	—	—	—	—	—
4106.....	S	M	M	M		M	M	M	M	M	M	M
Percent. M.....	40	100	80	80		40	40	40	20	40	20	40

TABLE 50.

Lucerne Hay Experiment.

Grazing Cattle given 10 lb. Lucerne Hay per Head per Day.

Date.	March.				April.					May.				June.		
	1.	8.	15.	22.	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.
1919.																
No. of Animal					10 lb. from 24th.											
105.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
211.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
228.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2707.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2724.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Percent. M..	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Kraaled Cattle given 10 lb. of Lucerne Hay, plus Pretoria Hay ad libitum.

136.....	M	M	S	M	Lucerne and hay.	M	M	M	M	M	M	M	M	—	M	M
140.....	M	M	M	M	Lucerne and hay.	M	M	M	S	—	S	—	—	—	—	—
2648.....	M	S	M	M	Lucerne and hay.	M	M	M	S	M	—	—	—	—	—	—
2889.....	M	M	M	M	Lucerne and hay.	M	M	M	S	S	M	M	S	—	S	—
4822.....	M	M	M	M	Lucerne and hay.	M	M	M	M	M	M	M	—	M	M	—
Percent. M..	100	80	80	100	100	100	100	40	60	60	60	40	20	20	40	20

TABLE 51.

Lucerne Hay Experiment—Cattle Supplied with 10 lb. per Head per Day.

Date.	May.		June.				July.		
	19.	27.	2.	11.	17.	23.	1.	8.	15.
1919.									
No. of Animal.									
1743.....	M..	M	M	M	M	M	M	M	M
2371.....	M	M	M	M	S	M	M	M	M
2404.....	M	M	M	M	M	M	M	M	M
2598.....	M	—	M	—	—	—	—	S	M
3082.....	M	—	M	—	S	S	M	S	—
3097.....	M	M	M	M	M	M	M	M	M
3716.....	—	—	—	—	—	M	M	M	M
3718.....	—	M	M	M	M	M	M	M	M
4226.....	M	M	M	M	M	M	M	M	M
4526.....	M	M	M	M	M	M	M	M	M
Percentage M.....	80	70	90	70	60	80	90	80	90

TABLE 52.

Grazing Cattle supplied with 6 lb. of Lucerne Hay per Head per Day.

Date. 1919.	August.		September.					Oct.
	18.	25.	1.	8.	15.	22.	30.	6.
No. of Animal.								
2371.....	—	—	—	—	S	M	M	M
3097.....	S	S	S	—	—	S	M	M
3716.....	—	—	S	M	M	M	M	M
938.....	—	—	—	—	—	—	—	S
3406.....	—	—	—	S	M	S	S	S
957.....	—	—	—	—	S	—	S	M
2907.....	—	—	S	M	M	S	S	M
2892.....	—	—	—	—	—	—	—	—
Percentage M.....	0	0	0	25	38	25	38	63

TABLE 53.

Grazing Cattle on Maize-meal with and without Lucerne Hay.

LOT I.—5 lb. Maize-meal per Head per Day.

Date. 1920.	April.				May.				June.		
	12.	19.	26.	3.		10.	17.	24.	1.	7.	14.
No. of Animal.											
124.....	M	M	M	M	Feeding begun.	M	M	M	M	M	—
236.....	M	M	M	M		M	M	M	M	M	M
3867.....	M	M	M	M		M	M	M	—	—	M
4323.....	M	M	M	M		M	M	M	M	M	M
4544.....	M	M	M	M		M	M	M	M	M	M
Percentage M...	100	100	100	100			100	100	100	80	80

LOT II.—5 lb. Maize-meal and 5 lb. Lucerne Hay per Head per Day.

139.....	M	M	M	M	Feeding begun.	M	M	M	M	M	M
245.....	M	M	M	M		M	M	M	M	M	M
4229.....	M	M	M	M		M	M	M	S	S	M
4523.....	M	M	M	M		M	M	M	S	—	M
2691.....	M	M	M	M		M	M	M	S	M	M
Percentage M...	100	100	100	100			100	100	100	40	60

TABLE 54.

Cattle showing Craving and Cattle after Reduction of Craving given a Ration of Maize-meal and Lucerne Hay as Supplement to Veld Grazing. From 28th July, 4 lb. of Meal and 6 lb. of Lucerne. From 26th August, 3 lb. of Meal and 4 lb. of Lucerne.

Cravers.

Date.	July.			August.				September.				Oct.				
	1919.	28.	5.	11.	18.	25.		1.	8.	15.	22.	29.	7.			
No. of Animal.	Craving returning on veld grazing	M	M	M	Commenced.	M	S	Ration reduced.	—	—	S	S	Discontinued.	S	S	
1937.....		S	M	M		S	S		—	—	S	—		S	S	M
3221.....		M	M	M		M	S		M	S	S	—		—	M	S
3247.....		M	M	M		M	S		M	S	S	—		—	S	S
3601.....		M	M	M		M	S		M	S	S	S		S	S	S
3604.....		M	M	M		M	S		M	S	S	S		S	S	M
Percentage M		80	100	100		80	0		60	20	0	0		20	60	

Reduced Cravers.

No. of Animal.	Craving being reduced upon supplementary ration.				Commenced.			Ration reduced.					Feeding discontinued.						
145.....		—	—	—		—	—		—	—	—	—		—	—	—	S	M	
157.....		—	—	—		—	—		—	—	—	—		—	—	—	S	M	
158.....		—	—	—		—	—		—	S	—	S		—	—	—	S	M	
164.....		—	—	—		—	—		—	—	—	—		—	—	—	S	M	
3991.....		—	—	—		—	—		—	—	—	M		S	S	—	S	M	
4048.....		—	—	—		—	—		—	—	—	—		S	—	—	S	M	
4357.....		—	—	—		—	—		—	—	—	—		—	—	—	S	M	
152.....		—	—	—		—	—		—	—	—	—		—	—	—	—	—	
198.....		—	—	—		—	—		—	—	—	—		—	—	—	—	M	
199.....		—	—	—		—	—		—	—	—	—		—	—	—	—	S	
Percentage M				0		0			0	0		10		0	0	0		0	40

TABLE 55.

Sodium Oxalate given in a little Maize-meal. Commenced on 24th March with the Quantities of Oxalate shown.

Date.	March.						April.					May.
	1.	8.	15.	22.		29.	5.	12.	19.		26.	3.
1920.												
No. of Animal.												
124.....	M	M	M	S		S	M	M	M		M	M
125.....	M	M	M	M	30 gms.	M	M	M	M		—	S
139.....	M	M	M	M		M	M	M	M		M	M
236.....	M	M	M	M		M	M	M	M	50 gms.	M	M
245.....	M	M	M	M	30 gms.	M	M	M	M		M	M
3367.....	M	M	M	M		M	M	M	M		M	M
4229.....	M	M	M	M		M	M	M	M		M	M
4323.....	M	M	M	M		M	M	M	M	Dis-	M	M
4523.....	—	—	—	M	20 gms.	M	M	M	M	continued.	M	M
4544.....	M	M	M	M		M	M	M	M		M	M
Percentage M..	90	90	90	90		90	100	100	100		90	90

TABLE 56.

Calves receiving 2 lb. of Wheaten Bran and from $\frac{1}{2}$ oz. to 1 oz. of Calcium Hydroxide per Head per Day. Commenced 17th September.

Date.	Sept.		October.				November.				December.					
	22.	30.	8.	13.	20.	27.	3.	10.		17.	24.	1.	8.	15.	22.	29.
1919-1920.																
No. of Animal.																
4109.....	S	S	M	S	S	—	—	—	—	—	—	M	M	M	M	M
4346.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4398.....	S	M	S	S	M	M	S	—	—	M	S	M	S	M	M	M
4399.....	—	—	—	—	—	—	—	—	—	—	S	S	S	S	S	S
4402.....	—	—	—	—	—	—	—	—	—	—	S	M	M	S	M	S
4409.....	S	S	S	—	—	—	—	—	—	—	S	M	M	M	S	M
Percentage M	0	17	17	0	17	17	0	0		17	0	67	50	50	50	50

Previous ration stopped

On 23rd, 2 lb. bran plus 1 oz. lime.

Date.	January.				February.				March				Apr.		
	5.		12.	19.	26.	2.	9.	16.	23.	1.	8.	15.	22.	29.	5.
1919-1920.															
No. of Animal.															
4109.....	M		M	M	M	M	Exit.								
4346.....	—	Discontinued on 8th.	—	M	S	M	—	—	—	—	—	—	—	—	—
4398.....	—		M	M	M	M	M	M	M	M	M	—	—	M	M
4399.....	—		—	M	S	S	—	—	—	—	—	—	—	M	M
4402.....	—		S	S	S	S	M	S	M	M	M	M	M	M	M
4409.....	S		M	S	S	S	S	S	S	S	—	—	—	M	—
Percentage M	17		50	50	33	33	40	20	40	40	40	40	20	80	60

TABLE 57.

Kraaled Cattle on Moderate Ration, and on "Semi-starvation" Ration. Showing the Influence of Underfeeding upon Osteophagia.

LOT I.—*Moderate Rations: Pretoria Hay, 12 lb.; Maize-meal, 3 lb.*

Date.	March.				April.				May.				June.			
	1	9	16	23	29	5	12	19	26	3	10	17	24	1	7	14
No. of Animal.					24th commenced.											
217.....	M	M	M	M		M	M	M	S	—	M	S	S	—	—	—
3410.....	M	M	M	M		M	M	M	S	S	S	M	—	S	—	M
3718.....	M	M	M	M		M	M	M	M	M	M	M	M	M	M	M
3898.....	M	M	M	M		M	M	M	M	M	M	M	M	S	M	M
4048.....	M	M	M	M		M	M	S	—	—	—	—	S	—	—	—
Percentage M.....	100	100	100	100	100	100	80	40	40	60	60	40	20	40	40	60

LOT II.—*Semi-starvation Ration: Hay, 6 lb.; Maize-meal, 1½ lb.*

No. of Animal.	M	M	M	M	24th commenced.	—	—	—	—	—	—	—	—	—	—	—
238.....	M	M	M	M		S	M	—	S	S	—	—	—	—	—	—
257.....	M	M	M	M		M	M	S	—	—	—	—	—	—	—	—
3904.....	M	M	M	M		M	M	S	M	M	M	M	S	S	S	S
4051.....	M	M	M	M		—	—	—	—	S	—	—	—	S	—	—
4542.....	M	M	M	M		—	—	—	—	—	—	—	—	—	—	—
Percentage M...	100	100	100	100	40	60	0	20	20	20	20	20	0	0	0	0

TABLE 58.

Kraaled Cattle on Moderate Ration and on "Semi-starvation" Ration; with added Phosphate.

LOT I.—*Hay, 12 lb.; Maize, 3 lb.; Calcium Phosphate, 27 grammes.*

Date. 1920.	March.				April.					May.				June.			
	1.	9.	16.	23.	Commenced on 24th.	29.	5.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.
No. of Animal.																	
3604.....	M	S	M	S	Commenced on 24th.	—	M	—	—	—	—	—	—	—	S	—	—
4103.....	M	M	M	M		M	M	M	M	M	M	M	M	—	—	S	—
4190.....	M	M	M	M		M	M	M	M	M	M	M	M	—	—	M	M
4322.....	M	S	M	M		M	M	M	M	M	M	M	—	S	M	M	—
4357.....	M	M	M	M		M	M	S	—	—	—	S	—	—	S	—	—
Percentage M.....	100	60	100	80		80	100	60	60	60	60	60	40	20	40	40	20

LOT II.—*Semi-starvation Ration: Hay, 6 lb.; Maize, 1½ lb.; Calcium Phosphate, 45 grammes.*

					Commenced on 24th.												
159.....	M	M	M	M	Commenced on 24th.	S	—	S	—	—	—	—	—	—	—	—	
160.....	M	M	M	M		M	M	M	M	S	S	M	S	S	—	—	
180.....	M	M	M	M		M	—	S	M	—	—	—	—	—	—	—	
200.....	M	M	M	M		M	S	S	M	M	M	S	M	S	—	S	S
4532.....	M	M	M	M		M	—	S	—	—	—	—	—	—	—	—	—
Percentage M.....	100	100	100	100		80	20	20	60	20	20	20	20	0	0	0	0

TABLE 59.

Removal of Osteophagia, on a Mixed Ration, in Cattle sent from Armoedsvlakte; Reproduction of Osteophagia on a Phosphorus-low Diet of Chaff and Fanko, and subsequent removal by administration of Phosphoric Acid.

Experiment conducted in Kraals at Onderstepoort, i.e. away from Lamsiekte Area.

Date.	June.					July.					August.					September.					October.					November.					December.				
	26.	7.	14.	24.	30.	6.	12.	19.	26.	2.	9.	16.	30.	Diet changed to chaff and Fanko in equal proportions by weight.					7.	8.	24.	2.	8.	15.	28.	5.	13.	20.	27.						
1919-1920.	Mixed ration of hay, maize, and bran.																																		
No. of Animal.	M	—	—	—	—	—	—	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	—	—	—	—	—	—	—	—	—	—					
3799.....	M	—	—	—	—	—	—	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	—	—	—	—	—	—	—	—	—	—					
3901.....	M	M	M	M	—	—	—	M	M	—	—	—	M	Diet changed to chaff and Fanko in equal proportions by weight.					—	M	M	M	M	M	M	M	M	M	M	M					
3904.....	M	M	—	—	—	—	—	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	—	—	—	—	—	—	—	—	—	—					
4052.....	M	—	—	M	—	—	—	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	—	—	—	—	—	—	—	—	—	—					
4104.....	M	—	—	—	—	—	—	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	—	—	—	—	—	—	—	—	—	—					
4107.....	M	M	M	M	M	—	M	M	M	—	M	—	M	Diet changed to chaff and Fanko in equal proportions by weight.					M	M	M	M	M	M	M	M	M	—	—	M					
4283.....	M	—	—	—	—	—	—	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	—	—	—	—	—	—	—	—	—	—					
4349.....	M	M	M	—	—	—	—	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	M	M	M	M	M	M	M	M	M	M					
4529.....	M	M	—	—	—	—	M	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	—	—	—	M	M	M	M	M	M	M					
4550.....	M	M	—	M	—	—	—	—	—	—	—	—	—	Diet changed to chaff and Fanko in equal proportions by weight.					—	—	—	M	—	—	—	—	—	—	—	—					
Percentage M...	100	60	30	40	10	0	20	20	20	0	10	10	10	Diet changed to chaff and Fanko in equal proportions by weight.					10	20	30	40	30	30	40	40	50	50	70						

NOTE.—Only one class of bone used for testing and therefore no differentiation in degree of craving.
M denotes Osteophagia, and — absence of Osteophagia.

TABLE 59—(continued).

Date.	January.			February.				March.			April.		May.		June.			July.				
	3.	16.	28.	7.	14.	21.	28.	6.	3.	20.	27.	10.	24.	5.	14.	29.	4.	11.	18.	25.	7.	
1919-1920.																						
No. of Animal.																Now dosed with phosphoric acid, 30 c.c. per head per day.						
3799.....	—	—	M	M	M	M	—	—	M	M	M	M	M	M	M		M	—	—	—	—	—
3901.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M	—	M	—	—
3904.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M	—	—	—	—
4052.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—	—	—	—	—
4104.....	—	—	—	M	M	M	M	M	M	M	M	M	M	M	M		—	—	M	—	—	—
4107.....	M	—	—	M	—	M	M	M	M	M	M	M	M	M	M		M	—	—	M	—	—
4283.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M	—	M	—	—
4349.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M	—	M	M	—
4529.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M	M	—	—	—
4550.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	—	—	—	—	
Percentage M...	60	60	70	90	80	90	80	80	90	90	90	90	90	90	90	80	60	30	40	0	0	

M denotes Osteophagia, and — absence of Osteophagia.

TABLE 60.

Four Cravers sent from Armoedsvlakte, kraaled at Onderstepoort and fed first on Pretoria Hay, then on Pretoria Hay and Fanko in equal porportions by weight ; finally 2 lb. Bran added per head per day.

Date.	June.					July.					August.					September.					October.					November.					December.				
	1919-1920.	26.	7.	14.	24.	30.	6.	12.	19.	26.	2.	9.	16.	30.	7.	18.	24.	2.	8.	15.	28.	5.	13.	23.	27.										
No. of Animal.	Commenced on Pretoria hay.	M	M	M	M	M	—	M	M	M	M	M	M	—	—	M	—	M	M	—	—	M	—	—	M										
3909.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M									
4086.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M									
4360.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M									
4539.....		M	M	M	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	M	M	M	M	M									
Percentage M.		100	100	100	100	75	50	75	75	75	75	75	50	50	75	50		50	50	50	75	75	50	50	100										

Date.	January.					February.					March.					April.			May.			June.				July.	
	1919-1920.	3.	9.	16.	23.	2.	7.	14.	21.	28.	6.	13.	20.	27.	10.	24.	7.	14.	21.	29.	2-lb. bran added.	4.	11.	18.	25.	7.	
No. of Animal.		M	M	M	M	M	—	—	M	M	M	M	—	M	M	M	M	M	M	M	2-lb. bran added.	M	M	—	—	—	
3909.....		M	—	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M		M	M	M	M	—	—
4086.....		M	—	—	—	M	M	M	M	M	M	M	M	—	M	M	—	M	M	M		M	M	M	M	—	—
4360.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	—	M	M		M	M	M	M	—	—
4539.....		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	—	M	M		M	M	M	M	—	—
Percentage M...		100	50	75	75	100	75	75	100	100	100	100	75	75	100	100	75	75	100	100		100	100	50	0	0	

NOTE.—Only one class of bone used for testing, and therefore no differentiation in degree of craving.
M denotes Osteophagia, and — absence of Osteophagia.

TABLE 61.

Analysis of Armoedsvalakte Soils (Hall's Method). Percentage Analysis after Removal of Small Proportion of Stones Chemical.

Sample.	I.	II.	III.	IV.
Moisture.....	1.35	6.88	0.77	0.75
Loss on ignition.....	2.47	27.47	2.58	2.33
Insoluble matter.....	90.57	31.07	90.18	92.26
Iron oxide and alumina.....	5.16	1.56	6.10	4.37
Lime.....	0.39	12.07	0.16	0.25
Magnesia.....	0.34	21.34	0.12	0.09
Total potash.....	0.37	0.11	0.95	0.42
Total phosphoric oxide.....	0.02	0.12	0.03	0.03
" Available " potash.....	0.0163	0.0157	0.0109	0.0158
" Available " phosphoric oxide.....	0.0008	0.0010	0.0005	0.0022
Calcium carbonate.....	0.32	45.00	0.12	0.22
Nitrogen.....	0.095	0.238	0.081	0.062

Mechanical.

Sample.	II.	III.	IV.
Fine gravel.....	0.12	4.82	3.40
Sand.....	5.30	30.66	28.89
Fine sand.....	19.19	48.82	56.80
Silt.....	10.83	1.95	1.66
Fine silt.....	8.52	1.91	1.32
Very fine silt (.005 — .002 mm.).....	6.00	1.61	1.19
Clay.....	7.47	7.15	4.00

TABLE 62.

Controls to Cattle in Manured Camps A and B, Grazing in Unmanured Camps.

Date.	April.				May.				June.					
	12.	19.	26.	Bone-meal fed to reduce craving.	3.	10.	17.	Bone-meal stopped.	24.	1.	7.	14.	21.	
No. of Animal.														
198.....	M	—	S	Bone-meal fed to reduce craving.	—	—	—	Bone-meal stopped.	—	M	M	M	M	
260.....	S	—	M		S	S	—		S	M	M	M	M	M
3154.....	S	M	S		—	—	—		—	S	M	M	M	M
3842.....	M	M	—		—	—	—		—	M	S	M	S	S
4187.....	S	S	M		—	—	—		—	M	M	M	M	M
Percentage M...	40	40	40		0	0	0		0	80	80	100	80	

TABLE 63.

Effect of Manuring with Superphosphate. 10 "Reduced Cravers" and 15 "Marked Cravers" allowed to Graze in "Manured Camp A."

Reduced Cravers.

Date.	April.			May.				June.				July.		
	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.	21.	28.	5.	12.
1920.														
No. of Animal.				On 26th bone-meal fed to reduce cravng.				18th, all transferred to manured camp A.						
111.....	M	M	M	—	—	—	—	—	—	—	—	—	—	—
175.....	S	M	M	—	—	—	—	—	—	—	—	—	—	—
2634.....	M	M	M	—	—	—	—	—	—	—	—	—	—	—
3807.....	M	S	M	—	—	—	—	—	—	—	—	—	—	—
3911.....	M	M	M	—	—	—	—	—	—	—	—	—	—	—
141.....	M	M	M	M	M	—	—	—	—	—	—	—	—	—
2371.....	S	M	M	M	M	—	—	—	—	—	—	—	—	—
3600.....	M	M	M	S	S	—	—	—	—	—	—	—	—	—
4141.....	M	M	M	M	M	—	—	—	—	—	—	—	—	—
4435.....	M	M	M	M	M	—	—	—	—	—	—	—	—	—
Percentage M.	80	80	100	40	30	0	0	0	0	0	0	0	0	0

Marked Cravers.

Date.	April.			May.				June.				July.		
	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.	21.	28.	5.	12.
1920.														
No. of Animal.				On 5th, transferred to manured camp A.										
184.....	M	M	M	M	M	S	—	—	—	—	—	—	—	—
255.....	M	M	M	M	M	M	S	S	M	—	—	—	—	—
258.....	—	M	M	M	M	M	S	—	—	—	M	M	—	—
3876.....	M	S	S	M	M	S	S	—	—	—	M	M	S	M
3880.....	M	M	M	M	M	—	—	—	—	—	—	—	—	—
4353.....	M	M	M	M	M	S	—	—	—	—	—	—	—	—
4374.....	M	M	M	M	M	M	—	—	S	—	—	—	—	—
4405.....	M	M	M	M	M	M	M	M	M	M	S	M	M	M
4406.....	M	M	—	M	S	S	—	—	—	—	S	M	S	—
4408.....	S	M	M	M	M	M	M	M	M	S	M	S	—	—
4451.....	—	M	M	M	M	M	—	—	—	—	—	—	—	—
4512.....	M	M	M	M	S	S	—	—	—	—	—	—	—	—
4540.....	M	S	M	M	M	—	—	—	—	—	—	—	—	—
4669.....	M	M	S	M	M	M	—	—	—	—	—	—	—	—
4682.....	M	M	M	M	M	M	—	—	—	—	—	—	—	—
Percentage M.	80	87	80	100	80	67	17	17	25	7	25	25	7	17

TABLE 64.

Effect of Manuring with a Mixed "Garden Fertilizer." 10 "Reduced Cravers" and 15 "Marked Cravers" allowed to Graze in "Manured Camp B."

Reduced Cravers.

Date. 1920.	April.			May.				June.					July.			
	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.	21.	28.	5.	12.		
No. of Animal.																
123.....	M	S	S					M	S	S	S	S	S			
253.....	M	S	M						S	S	S					
3778.....	M	M	M						M	S						
3872.....	M	M	M					S	S	S	M	M	M	M		
4095.....	M	M	M						S							
109.....	M	M	M					S		S	S	S				
116.....	M	M	M						S	S	S	S	S			
3318.....	M	M	M							S	S	S	S	S		
3595.....	M	M	M						M	M	M	M	S	M		
4098.....	M	M	M							M	M					
Percentage M..	100	80	90		30	30	0		10		20	20	30	20	10	20

Marked Cravers.

Date. 1920.	April.				May.				June.					July.	
	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.	21.	28.	5.	12.	
No. of Animal.															
119.....	S	M	M	M	M	M	M	M	M	M	M	S	S	S	
162.....	M	M	M	M	M	M	M	S	M		S				
240.....	M	M	M	M	M	M	M	M	M	M	M	M			
4266.....	M	M	M	M	M	S	S	S	S						
4363.....	M	M		M	S	M	M	S		S	S	S			
4370.....		M	M	M	S	M		M	M	S					
4400.....	M		M	M	M	M		M	M	M	M	S			
4407.....	M	M	M	M	S	M	M	M	S	M	M				
4441.....	M	M	M	M	M	M	M	M	M	M	M	M			
4447.....	S	M	M	M		S	S		S						
4449.....	M	M	M	M	M	M	M	M	S	M	S				
4514.....	M	M	M	M	M	M	M	S	S	S	M	M	M		
4521.....	M	M	M	M	M	M	M	M	M	M	M	M			
4677.....	M	M	M	M	M	M	M	S	M	M	M	S			
4699.....	M	M	M	M	M	M	M	M	M	M	M				
Percentage M	80	93	93	100		73	86	73	60	60	60	60	20	7	0

TABLE 65.

“Rotten Bones Experiment.” Cattle have Access to Rotten Bones Every Morning and are Tested Once a Week.

Date. 1920.	March.			April.				May.				June.		
	16.	23.	30.	6.	12.	19.	26.	3.	10.	17.	24.	1.	7.	14.
No. of Animal.														
104.....	M	M	M	M	M	M	M	M	M	M	M	M	—	—
176.....	M	M	M	M	S	M	M	M	M	M	S	M	M	M
2947.....	M	M	M	M	M	M	M	S	M	M	M	M	M	M
3380.....	M	M	—	—	S	S	—	S	M	M	M	M	—	—
3801.....	S	M	—	—	M	M	M	M	M	M	M	M	M	M
3818.....	S	M	—	S	—	M	M	M	S	S	S	S	M	M
3843.....	M	M	—	—	M	M	M	M	M	M	M	M	M	M
4226.....	—	M	—	—	M	M	M	M	S	M	S	M	M	M
4362.....	—	S	—	—	—	—	—	—	S	S	S	M	M	M
4526.....	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Percentage M...	60	90	40	40	60	80	80	70	70	80	60	90	80	80