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Fattening Range Lambs

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South Dakota
Agricultural College
Experiment Station
Brookings, South Dakota

Department of
Animal Husbandry

Fattening Range Lambs

1904
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FATTENING RANGE LAMBS.

James W. Wilson

H. G. Skinner

Certain sections of South Dakota, known as the range, where live stock is produced the cheapest, furnish a large per cent of the lambs for the feeding yards of this and the adjoining states. On account of the small amount of rainfall, the native grasses in this section cure while standing on the ground and furnish a very palatable and nutritious feed for stock. The lambs are purchased in the fall when from five to seven months old, pastured on rape or good pasture grasses until cold weather, then put into the feed yard and grained during the winter months for the early spring market. For the past several years the Chicago market at this time has been good for lambs of this quality, in many cases fetching as much and sometimes more per hundred than the high-bred natives. It has been a very profitable business as the growth of the lambs is rapid and the selling price has been from 75 to 100 per cent more than the purchase price.

The South Dakota feeders engaged in this business are wise because every bushel of grain fed at home adds fertility to the soil and reduces the expense of marketing to the minimum. In some of the adjoining states, especially in the older sections of the western Mississippi valley, the live stock industry has been a potent factor in solving the problem of retaining the natural fertility of the soil. It has been demonstrated that raising crops year after year on the same land and selling them in their natural form without the use of animals to produce manure, materially impairs the producing capacity of the soil. Further east commercial fertilizers are used extensively which render the cost of production comparatively high.

In some of the most densely populated sections of this state where the farms are highly improved and large yields of grain are obtained annually, the feeding of live stock is practically unknown. Roberts of the New York Experiment Station found

that sheep manure was worth more per ton as a fertilizer than that made by any other farm animal.

According to the report of the Division of Statistics, United States Department of Agriculture, South Dakota on January 1st, 1901, had 794,449 head of sheep; January 1st, 1904 the total number was 927,246, making an increase in the past three years of 132,797 head.

The work herein recorded is a continuation of a line of investigation undertaken at this Station to ascertain the relative feeding value, for sheep, of some of the grains recently introduced from Europe and Asia into this state through this Station by the United States Department of Agriculture, as compared with that of the commonly grown grains.

Four lots in this test were fed speltz, macaroni wheat bread wheat and corn, the same kinds of grains used for four lots in the test one year ago, the result of which was published in Bulletin No. 80. This will also serve as a basis for comparison of the advantage in feeding the high grade Shropshire and the range lamb as they were handled under the same conditions in both tests.

THE EXPERIMENT.

During the last week of September one hundred head of wether lambs from five to seven months old were purchased by the Station from three different ranchmen in the vicinity of Harold, Hughes County, this state.

The lambs were selected for as much uniformity as to age and size as possible, regardless of breed.



As may be seen by the above cut they were not uniform as to breed, some were down crosses, some were long woolled and others were of merino ancestry, but were considered a good average of the lambs raised on the range. Upon arrival at the Station farm they were dipped in order to kill all external parasites and turned into a field of rape sowed with a nurse crop of oats and not pastured previous to this time.

They remained on the rape for ten weeks, or until severe cold weather, when they were given daily a light grain allowance of a mixture of the grains to be used in the experiment. On the second of January they were weighed and divided into ten lots of ten head each, making the lots equal in weight as far as possible. The test covered a feeding period of 111 days, beginning the second of January and ending the twenty-second of April. The lambs were shorn on April second, about three weeks previous to shipping, to note the effect of shearing. To lot I was fed the common bread wheat, Lot II macaroni wheat, Lot III oats, Lot IV barley, Lot V speltz, Lot VI millet, Lot VII corn, Lot VIII corn and speltz, Lot IX barley and speltz and Lot X macaroni wheat and speltz. The grains for the last three enumerated lots were mixed half and half by weight. Each lot was started on one-half pound per head daily and finally given all the grain they would eat up clean, both morning and evening, and in addition all the prairie and *Bromus inermis* hay they would eat. The grains were weighed for each feed. The hay was weighed several times during the feeding period and it was found that they were consuming about one and one-third pounds per head daily. Salt and water were kept before them at all times. Two lambs died at the beginning of the experiment, one that was receiving barley and speltz and the other receiving wheat and speltz; and two others were withdrawn at the end of the first month on account of being troubled with worms. These two latter mentioned lambs were in the lots receiving millet and corn.

The feeds used in this test are well adapted to the climatic conditions of this state. Macaroni wheat, speltz and millet are large yielders and can be grown successfully in nearly all sections.

The millet seed was of the Black Veronezh (*Panicum miliaceum*) variety. It was introduced into the state by the United

States Department of Agriculture, through this Station, and has proved to be a heavy yielder and a very palatable and nutritious feed for cattle, sheep and swine. A yield of thirty bushels per acre was obtained from a carefully conducted experiment in crop rotation at this Station, in 1902, and its evident adaptability to our conditions will undoubtedly bring it into popular favor as one of the principal grains with the stockman. A good yield was obtained last year on spring breaking of the prairie sod and also on a field where it was too wet to plant corn on the College Farm. Evidently this millet may be sown quite late and still mature a good crop.

The following is an analysis of the Black Voronezh millet seed as prepared by James H. Shepard, Chemist of this Station:

	Air Dry Substance	Water Free Substance
Water	9.79
Ash	3.17	3.51
Ether Extract.....	4.36	4.83
Crude Fibre.....	10.40	11.40
Crude Protein.....	14.28	15.65
N:-free Extract.....	58.00	64.61
	<hr/>	<hr/>
Total Nitrogen.....	2.28	2.52
Albuminoid Nitrogen.....	2.18	2.41

A trial experiment was made previous to the test, with five head of sheep, feeding the seed unground, but it was found that a large per cent was voided undigested by the animals, and they did not thrive as they should, consequently the seed was ground coarsely for the lot in the experiment. During the entire feeding period this lot of lambs was as thrifty and consumed their feed with as high a degree of relish and the gains were quite as uniform as for any other lot, as may be seen by the table of weights and gains.

Each lamb was weighed separately every two weeks to note the gain or loss and as it may be of interest to the young or inexperienced feeder, the record is presented in the following pages. It will be noticed that neither the lightest nor the heaviest lambs at the beginning of the test made the best gains, and that the smallest and largest gains were made by lambs receiving wheat and speltz and bread wheat, being nine and one-half and fifty pounds respectively

WEIGHTS AND GAINS.
Lot I—Wheat.

LAMBS NUMBER.	Jan. 2.....	Jan. 16.....	Jan. 30.....	Feb. 13.....	Feb. 27.....	Mar. 12.....	Apr. 2.....	Apr. 22.....	Weight of Wool	Weight Apr. 22 including Wool	Total gain per Head...
683	73	75	81	83	87	93	96	95	52	106	27
717	78	82	89	91	96	99	100	107	50	112	34
720	73	74	81	85	86	91	98	97	50	107	34
721	87	91	98	100	108	108	108	112	54	112	25
752	61	65	70	70	73	75	81	85	48	118	57
757	55	57	62	61	64	66	67	72	44	82	27
762	68	75	81	82	87	87	92	90	50	107	39
768	62	66	73	75	78	77	83	89	48	94	32
764	74	81	88	92	100	109	114	118	52	124	50
742	74	73	81	85	83	98	110	103	51	107	33
Gain	705	739	802	824	862	903	949	968	52	1020	—
Total		34	63	22	38	41	46			71	315

Lot II—Macaroni Wheat.

LAMBS NUMBER.	Jan. 2.....	Jan. 15.....	Jan. 30.....	Feb. 13.....	Feb. 27.....	Mar. 12.....	Apr. 2.....	Apr. 22.....	Weight of Wool	Weight Apr. 22 including Wool	Total gain per Head...
687	56	59	63	65	66	72	76	77	4	81	25
689	74	79	87	92	95	101	105	106	4	110	36
704	67	74	79	81	84	88	91	96	5	101	34
705	65	68	74	74	76	85	87	89	5	94	29
710	86	89	96	98	103	104	110	113	5	118	32
711	74	74	83	87	89	93	96	101	5	106	32
725	63	67	73	73	73	81	82	89	4	93	30
733	79	80	86	88	90	92	98	101	5	106	27
734	76	81	85	88	87	98	102	104	5	108	32
751	66	67	71	76	79	86	90	93	5	98	32
Total	705	738	797	826	853	900	937	969	51	1020	—
Gain		33	69	29	27	47	37			83	315

Lot III—Oats.

LAMBS NUMBER.	Jan. 2	Jan. 16	Jan. 30	Feb. 13	Feb. 27	Mar. 12	Apr. 2	Apr. 22	Weight of Wool	Weight Apr. 22 including Wool	Total gain per Head
678	71	72	74	75	77	82	84	82	4 1/2	90 1/2	15 1/2
682	71	72	74	75	77	82	84	82	4 1/2	90 1/2	15 1/2
698	70	71	73	75	78	83	85	83	4 1/2	104 1/2	18 1/2
709	73	75	77	80	82	87	90	88	5 1/2	112 1/2	21 1/2
706	83	85	90	93	96	103	108	107	6 1/2	113 1/2	21 1/2
716	83	86	92	93	96	103	109	107	6 1/2	112 1/2	21 1/2
718	78	82	87	100	104	106	108	107	5 1/2	112 1/2	21 1/2
724	72	75	83	83	88	97	97	100	4 1/2	104 1/2	22 1/2
736	51	56	59	60	67	74	77	80	3 1/2	85 1/2	21 1/2
769	69	74	77	80	84	90	95	94	3 1/2	93 1/2	20 1/2
	49	52	59	62	65	69	70	72	4 1/2	76 1/2	27 1/2
Total	705	741	788	808	840	906	931	929	52 1/2	981 1/2	176 1/2
Gain		40	43	15	37	66	25		50 1/2		176 1/2

Lot IV—Barley.

LAMBS NUMBER.	Jan. 2	Jan. 16	Jan. 30	Feb. 13	Feb. 27	Mar. 12	Apr. 2	Apr. 22	Weight of Wool	Weight Apr. 22 including Wool	Total gain per Head
684	61	68	72	77	78	83	86	84	4 1/2	90 1/2	17 1/2
696	61	68	72	77	78	83	86	84	4 1/2	90 1/2	17 1/2
714	61	64	67	70	73	79	80	80	5 1/2	91 1/2	19 1/2
722	61	66	71	73	76	86	95	100	6 1/2	107 1/2	20 1/2
723	61	62	75	78	81	88	90	81	6 1/2	86 1/2	25 1/2
739	61	67	75	82	86	91	106	105	6 1/2	111 1/2	24 1/2
740	65	66	72	74	79	89	94	96	5 1/2	101 1/2	25 1/2
743	76	76	80	84	91	100	101	101	6 1/2	108 1/2	22 1/2
753	76	78	82	84	90	98	103	105	6 1/2	112 1/2	26 1/2
775	62	71	74	79	82	90	95	92	6 1/2	98 1/2	30 1/2
Total	705	728	768	815	834	915	946	921	59 1/2	990 1/2	285 1/2
Gain		23	40	73	29	51	30		45 1/2		285 1/2

Lot V—Speltz.

LAMBS NUMBER.	Jan. 2.....	Jan. 16.....	Jan. 30.....	Feb. 13.....	Feb. 27.....	Mar. 12.....	Apr. 2.....	Apr. 22.....	Weight of Wool.....	Weight Apr. 22 including Wool.....	Total gain per Head...
689	84	85	87	92	97	108	112	114	5 1/2	119 1/2	35
694	76	78	83	89	93	94	99	97	5 1/2	104 1/2	28
732	60	60	62	67	73	81	88	88	5 1/2	93 1/2	33
738	40	43	46	53	58	64	71	72	5 1/2	76 1/2	36
743	66	69	74	77	83	90	84	84	5 1/2	89 1/2	24
746	90	90	92	100	105	111	115	111	6 1/2	120 1/2	30
748	65	69	74	75	81	90	88	88	6 1/2	94 1/2	29
767	72	75	77	78	78	83	77	75	6	82 1/2	10
774	58	64	69	74	78	84	86	84	6	90	32
826	—	—	—	—	—	—	—	—	—	—	—
Total	703	722	755	788	820	885	897	892	50 1/2	951 1/2	—
Gain	—	19	33	30	35	65	32	—	—	44 1/2	248 1/2

Lot VI—Millet.

LAMBS NUMBER.	Jan. 2.....	Jan. 16.....	Jan. 30.....	Feb. 13.....	Feb. 27.....	Mar. 12.....	Apr. 2.....	Apr. 22.....	Weight of Wool.....	Weight Apr. 22 including Wool.....	Total gain per Head...
692	63	66	70	73	77	82	82	84	5 1/2	89 1/2	26 1/2
693	77	82	87	88	93	93	99	100	5 1/2	105 1/2	28 1/2
701	69	71	79	81	85	93	99	100	5 1/2	109 1/2	37 1/2
702	91	100	105	108	115	120	122	124	6 1/2	131 1/2	40
703	83	83	87	88	90	94	99	99	5 1/2	107 1/2	34 1/2
715	70	72	74	75	77	84	90	84	5 1/2	90 1/2	20 1/2
749	57	61	67	70	74	82	87	85	5 1/2	89 1/2	32 1/2
759	63	64	70	71	74	83	87	85	6 1/2	91 1/2	27 1/2
785	63	65	71	74	78	85	90	83	6	90	38
Total	636	664	710	728	763	822	857	860	57 1/2	917 1/2	—
Gain	—	28	46	18	35	59	35	—	—	60	281

Lot VII—Corn.

LAMBS NUMBER.	Jan. 2.....	Jan. 16.....	Jan. 30.....	Feb. 13.....	Feb. 27.....	Mar. 12.....	Apr. 2.....	Apr. 23.....	Weight of Wool.....	Weight Apr. 22 including Wool.....	Total gain per Head...
768	64	82	76	75	84	86	84	93	55	97	33
769	75	82	86	88	93	100	102	101	55	106	33
767	73	75	77	76	85	90	97	98	55	103	33
719	96	96	101	104	103	117	121	118	55	123	33
727	58	65	70	73	77	80	80	81	55	86	33
737	75	78	82	87	90	97	97	94	55	99	33
766	70	76	80	84	88	95	96	98	55	102	33
768	71	76	82	85	89	95	100	98	55	103	33
773	71	76	82	85	89	95	100	98	55	103	33
Total	610	677	720	717	786	847	874	868	462	914	404
Gain		37	43	27	39	61	27				274

Lot VIII—Corn and Speltz.

LAMBS NUMBER.	Jan. 2.....	Jan. 16.....	Jan. 30.....	Feb. 13.....	Feb. 27.....	Mar. 12.....	Apr. 2.....	Apr. 22.....	Weight of Wool.....	Weight Apr. 22 including Wool.....	Total gain per Head...
686	68	68	71	74	77	78	82	81	55	88	18
713	72	74	78	81	83	93	97	99	55	102	33
729	52	60	63	61	66	70	70	72	55	73	21
736	70	72	76	75	81	87	88	86	55	91	21
735	60	62	64	66	71	75	77	78	55	80	20
741	80	82	85	89	93	100	102	102	55	105	33
764	77	76	82	82	86	95	100	100	55	106	29
770	78	80	84	88	95	104	104	102	55	109	31
771	58	68	74	76	80	86	90	94	55	100	32
756	80	87	93	95	100	107	112	113	55	118	33
Total	705	729	770	787	832	895	923	930	532	973	551
Gain		24	41	17	45	63	27				272

Lot IX—Barley and Speltz.

LAMBS NUMBER.	Jan. 2.....	Jan. 16.....	Jan. 30.....	Feb. 13.....	Feb. 27.....	Mar. 12.....	Apr. 2.....	Apr. 22.....	Weight of Wool	Weight Apr. 22 including Wool	Total gain per Head....
617	62	62	60	61	64	70	70	70	55	75	13
681	73	76	81	84	86	91	95	91	66	86	23 $\frac{1}{2}$
691	72	75	81	85	91	102	108	108	4 $\frac{1}{2}$	40 $\frac{1}{2}$	40 $\frac{1}{2}$
697	89	93	96	98	105	111	111	106	112	112	23 $\frac{1}{2}$
703	66	69	75	82	85	97	100	99	5	104	33
756	70	73	84	86	90	99	104	101	5	108	33
728	79	80	80	84	91	100	105	106	6 $\frac{1}{2}$	112 $\frac{1}{2}$	33 $\frac{1}{2}$
756	67	70	74	80	85	91	98	97	5	102	35
761	67	70	74	80	85	91	98	97	5	102	35
772	65	65	67	70	75	82	85	83	5 $\frac{1}{2}$	88 $\frac{1}{2}$	23 $\frac{1}{2}$
Total	643	668	698	730	772	843	876	861	50 $\frac{1}{2}$	911 $\frac{1}{2}$	
Gain		25	30	32	42	71	33			35 $\frac{1}{2}$	268 $\frac{1}{2}$

Lot X—Wheat and Speltz.

LAMBS NUMBER.	Jan. 2.....	Jan. 16.....	Jan. 30.....	Feb. 13.....	Feb. 27.....	Mar. 12.....	Apr. 2.....	Apr. 22.....	Weight of Wool	Weight Apr. 22 including Wool	Total gain per Head....
680	72	76	78	82	83	91	93	93	6 $\frac{1}{2}$	99 $\frac{1}{2}$	27 $\frac{1}{2}$
695	69	69	74	78	80	88	93	90	6	96	27 $\frac{1}{2}$
699	79	83	86	91	92	104	104	108	7 $\frac{1}{2}$	103 $\frac{1}{2}$	24 $\frac{1}{2}$
709	64	69	70	74	75	84	84	85	6	91	27
731	72	77	82	84	86	94	100	98	5 $\frac{1}{2}$	103 $\frac{1}{2}$	31 $\frac{1}{2}$
744	72	72	75	76	77	80	82	77	4 $\frac{1}{2}$	81 $\frac{1}{2}$	9 $\frac{1}{2}$
747	70	68	74	74	80	86	89	88	6	94	24 $\frac{1}{2}$
755	62	63	70	73	76	81	84	81	6	87	25
758	73	73	78	78	80	84	87	85	4	89	16
Total	633	650	687	710	739	792	817	803	52 $\frac{1}{2}$	845 $\frac{1}{2}$	
Gain		17	37	23	19	63	25			23 $\frac{1}{2}$	212

The following page includes a financial statement, including the kinds of feed fed, the value of lambs at the end of experiment, the proceeds from wool and increase in price of original weight, the cost of grain, hay, marketing and the original price, the net profit per lot and the profit per head for each lot. It also contains table showing number of lambs, pounds of grain consumed up to shearing, pounds of gain made up to shearing, pounds of grain for a pound of gain, average gain per head daily before shearing, pounds of grain consumed after shearing, pounds of grain for a pound of gain after shearing, average gain per head daily after shearing, pounds of wool shorn, total pounds of grain fed, total pounds of gain made, total pounds of grain required for a pound of gain, total average gain per head daily and the cost of producing a pound of gain with the several lots. The gain after shearing in this test was not so great as it was with the native lambs fed one year ago on account of the unusually cold weather.

Financial Statement.

No of Lambs in lot	KINDS OF FEED FED.	DEBIT.		CREDIT.	
		Value at end of test in- cluding pro- ceeds from wool and in- crease in price of or- iginal weight per lot	Cost of grain, hay, m.a.r., killing and original price of lambs	Net profit per lot	Net profit per head
10	Wheat	\$60.21	\$17.20	\$13.01	\$1.30
10	Macaroni Wheat	60.03	46.92	13.11	1.31
10	Oats	58.20	43.28	14.92	1.49
10	Barley	59.51	41.04	18.47	1.84
10	Speltz	57.50	41.42	16.08	1.60
9	Millet	51.37	37.55	17.82	1.98
9	Corn	53.97	37.05	16.92	1.88
10	Corn and Speltz	58.84	40.67	18.17	1.81
9	Barley and Speltz	54.27	38.05	16.22	1.80
9	Macaroni Wheat and Speltz	51.57	39.98	11.59	1.28
96	Totals and Averages	\$63.47	\$43.16	\$156.20	\$1.62

Table No. 1.

	No. of Lambs...	Pounds of Grain Consumed up to Shearing...	Pounds of Grain Made up to Time of Shearing...	Pounds of Grain for a Pound of Gath...	Average Gain per Head Before Shearing...	Pounds of Grain Consumed After Shearing...	Pounds of Gain Made After Shearing...	Pounds of Grain for a Pound of Gain After Shearing...	Average Gain per Head After Shearing...	Pounds of Wool Shorn...	Total Pounds of Grain Fed...	May	Total pounds of Gain Made...	Total Pounds of Grain Required for a Pound of Gain...	Total Average Gain per Head Daily...	Cost of Feed per Pound of Gain, Cents...
Lot I—Wheat	10 1391	244	57	27	862	71	4	35	51	1678	1480	25	25	5.5	2.5	7.0
Lot II—Macaroni Wheat	10 1402	232	55	27	897	83	4	35	51	1589	1480	25	25	5.5	2.5	6.9
Lot III—Oats	10 1484	225	40	24	912	104	4	35	51	1794	1480	25	25	6.4	2.5	6.9
Lot IV—Barley	10 1459	240	44	24	882	43	4	35	51	1751	1480	25	25	6.1	2.5	6.9
Lot V—Speltz	10 1510	207	40	24	882	43	4	35	51	1635	1480	25	25	6.3	2.5	6.9
Lot VI—Millet	9 1313	221	34	24	877	60	4	35	51	1631	1332	25	25	6.2	2.5	6.7
Lot VII—Corn	9 1270	221	34	24	877	60	4	35	51	1540	1332	25	25	6.2	2.5	6.7
Lot VIII—Corn and Speltz	10 1418	217	34	24	879	40	4	35	51	1697	1332	25	25	6.3	2.5	6.7
Lot IX—Barley and Speltz	9 1406	232	34	24	882	35	4	35	51	1603	1332	25	25	6.3	2.5	6.6
Lot X—Macaroni Wheat and Speltz	9 1310	184	27	24	879	25	4	35	51	1589	1332	25	25	7.4	2.1	8.2
Averages	1396	223	6.2	25	898	52	5.7	26	54	1691	1120	276	6.1	2.6	6.2	

The table shows that the largest gains were made by Lots one, two and six or the ones that were fed on bread wheat, macaroni wheat and millet, being .28 of a pound daily; the smallest gain was with Lot ten or the one fed on a mixture, equal by weight of macaroni wheat and speltz, being .21 of a pound daily.

Of the three lots that were fed mixtures, Lot nine, or the one receiving barley and speltz, made the best gain.

The table also shows that the two kinds of wheats are practically equal as a feed for lambs and confirms the results obtained with feeding these grains one year ago, as recorded in Bulletin No. 80 of this Station. It also shows that the lot receiving millet made as large a gain per head daily as either of the wheat lots, and .01 of a pound more per head daily than the lot receiving corn. To produce a pound of gain required about two pounds more of speltz than of either wheat, corn or millet, and eight-tenths of a pound more than of oats. In Lots eight, nine and ten, where speltz was mixed with corn, barley and wheat, half and half by weight, the amount of grain required to produce a pound of gain, with the mixed feed, as compared to the average of the amount of grain required to produce a pound of gain, with the two lots receiving the single grain, was as follows:

With Lot eight the mixture caused a saving of three-tenths of a pound of feed for a pound of gain. In Lot nine there was a saving of four-tenths of a pound of grain for a pound of gain; and in Lot ten it required one pound more of the mixture to produce a pound of gain than with the average of the two lots receiving the single grain. It might be stated, however, that in Lot ten the two lambs numbered 758 and 744 did not make average gains for the lot. (See table of weights and gains.)

This table shows further that the gain per head daily was larger during the feeding period after shearing, which confirms the result of former experiments in this line, but it was not so large as in the test one year ago as referred to above. After these lambs were shorn there was a severe cold spell and it was impossible to keep them comfortable which no doubt accounts for the small gains during this period.

The one hundred head of lambs cost \$3.55 per hundred pounds delivered at the Station farm and when finished for market brought \$5.90 in Chicago. They netted \$5.26 at home costing sixty-four

cents per hundred to ship them by way of La Fox, Illinois, unloading and feeding. The wool was shipped to H. T. Thompson & Company and netted 17.8 cents per pound. It was graded as being medium, low medium, coarse and rough, the former bringing three cents per pound more than the latter and with the following comment: "An exceedingly well handled lot of good conditioned stock commanding top price for wool from your section. Very bright." In this connection it might be well to state that the quality of the wool can be improved by dipping the sheep in the fall as a large per cent of the dirt is then washed out. This price was the top for shorn lambs up to that time for this year and during the day but one other lot outsold them. The same price was placed on the whole load as the difference in the condition of the various lots was not sufficient to justify their separation.

FEEDS AND PRICES.

The feeds used in the tests were, with the exception of millet and hay purchased in the local market at the following prices:

Macaroni wheat, sixty-five cents per bushel.

Wheat, sixty-six cents per bushel.

Corn, forty cents per bushel.

Speltz, thirty-five cents per bushel.

Oats, twenty-six cents per bushel.

Barley, thirty-five cents per bushel.

Millet, forty cents per bushel.

Hay, five dollars per ton.

Millet as a feed for stock has no value in the local market, but after it was graded at 56 pounds per bushel and on account of the daily gains and the pounds of grain for a pound of gain made in this test being similar to that of corn, it has been placed at forty cents per bushel the same as corn. The above prices are somewhat higher than usual for these commodities but nevertheless, they are in keeping with the price received for the lambs.

SUMMARY.

1. The record of the lot fed on speltz in this test confirms the results obtained by feeding this grain in former experiments that it requires from one to two pounds more to produce a pound of gain than with the other grains.

2. Macaroni wheat as a feed for sheep is equal, pound for pound, to bread wheat and can be fed profitably at the prices quoted in this experiment.

3. This test indicates that the Black Veronezh (*Panicum miliaceum*) variety of millet seed, when ground coarsely, is excellent feed for lambs; and, on account of the advantages for its growth in this state over other commonly grown cereals, it is a very valuable addition to our list of grains for the production of mutton.

4. The lot fed a mixture of speltz and barley, half and half by weight, made a larger gain for feed consumed than the average of the gain made by the two lots fed on barley and speltz. This was also true for Lot nine where corn was mixed with speltz in the same proportion as above, but with both lots it required more pounds of the mixture to produce a pound of gain than it did with either lots fed on barley or corn, which indicates that speltz has a greater feeding value for lambs when mixed with other grains than when fed alone.

5. The increase in gain per head daily made after shearing confirms the results of former experiments as it was larger but not so marked as with the experiment one year ago.

6. Dipping lambs in the fall before putting into the feed lot improves the quality of the wool by washing out foreign substances as is shown by this and with the test of one year ago.