

fed as in Lot 1 but not so large as where the APF was added to the plant protein as in Lot 2. The costs per 100 pounds gain were less in Lot 3 also. Adding APF to a mixed protein supplement as fed in Lot 3 increased the rate of gain, reduced the amount of feed consumed per 100 pounds gain, but increased the cost of the gains.

In this experiment, the efficiency of gain, indicated by the feed requirements, was in favor of the rations containing APF. The lots receiving APF also had a marked increase in the rate of gain.

The cost of gain increased slightly when the APF was fed with the different supplements.

It is evident from these results that the chief advantage of feeding APF in these experiments was the increased rate of gain of the hogs, rather than in any marked improvement in reducing the cost of the gains.

EXPERIMENT II—Summer, 1950

The Value of Thyroprotein in the Ration of Growing and Fattening Spring Pigs in the Dry Lot.

C. E. Aubel

It has long been known that the thyroid gland influences growth, metabolism and other functions in the body. In recent years numerous attempts have been made to influence growth, fattening, reproduction, milk and egg production in farm animals. Some trials have shown that an increased secretion of the thyroid gland or hyperthyroidism has, within certain limits, increased the growth rate in certain species of animals.

In this experiment, the effects of hyperthyroidism in swine were studied through the feeding of thyroprotein, which in this case was thyroactive iodinated casein. It contains the hormone produced by the thyroid gland and its administration results in hyperthyroidism.

In the trial reported here, three lots of pigs weighing about 50 pounds were self-fed a basal ration of corn and wheat with a good protein and mineral mixture. One lot received only the basal ration, one received 5 grams (0.011%) of thyroprotein to each 100 pounds of the basal ration and a third lot received 10 grams (0.022%) to each 100 pounds of basal ration.

The following table gives a summary of the results of this experiment:

EXPERIMENT II—Summer, 1950

The Value of Thyroprotein in the Ration of Growing and Fattening Spring Pigs in the Dry Lot.

(June 9, 1950 to September 3, 1950—87 days)

Ration fed	Basal Ration (self-fed)		
	Basal ration only	5 grams thyroprotein per 100 lbs. basal ration	10 grams thyroprotein per 100 lbs. basal ration
Lot number	1	2	3
Number pigs per lot	6	6	6
Average initial weight per pig	Pounds 47.83	Pounds 48.33	Pounds 49.08
Average final weight per pig	199.83	200.00	194.50
Average total gain per pig	152.00	151.67	145.42
Average daily gain per pig	1.74	1.74	1.67
Average daily ration per pig			
Feed mixture	6.11	6.13	6.25
Feed consumed per 100 pounds gain			
Feed mixture	349.78	351.64	374.20

Methods of Feeding: A basal ration was self-fed in a feeder in the dry lot. The basal ration was composed of 66% corn, 20% wheat, 13% protein mixture and 1% mineral mixture. The mineral mixture was equal parts steamed bone meal, ground limestone and salt. The protein mixture was 4 parts meat scraps, 4 parts soybean meal, 1 part linseed meal and 1 part alfalfa leaf meal.

Discussion of Results

The addition of 5 grams (0.011%) of thyroprotein to 100 pounds of the basal ration did not affect the rate or total gain of the pigs as compared to another lot which did not receive thyroprotein. The amount of feeds per 100 pounds gain was practically the same in both lots.

In the lot that received 10 grams (0.022%) of thyroprotein or double the amount in the other lot, the gains were depressed and the feed consumption per 100 pounds gain was increased.

It would therefore seem, from this experiment, that the addition of thyroprotein to the ration of growing and fattening pigs was of no benefit so far as growing and fattening were concerned.

LAMB FEEDING EXPERIMENTS

Wheat Pasture and Feedlot Fattening Tests with Lambs.

Studies carried on by the Department of Animal Husbandry and the Garden City Branch Experiment Station.

By T. Donald Bell and A. B. Erhart.

This year's experiments included first, a series of wheat pasture tests, and later, various feedlot fattening tests. In the five lots of lambs on wheat pasture the effect of withholding salt, the value of additional roughage, and the efficiency of soda as well as vaccination in the control of over-eating disease, were studied. A check lot was fed a standard western Kansas feedlot ration.

Because of insufficient wheat pasture the lambs were removed after 39 days of grazing. They were re-sorted, weighed, and re-allotted into 11 lots and a new series of tests was started. Sorghum stover of different ages and other roughages were compared. The value of salt in the ration, as well as the value of drenching for worm control, were also studied.

Lambs:

New Mexico whiteface lambs were used in this year's tests. They were smooth and of good quality but because of drouth conditions the lambs were lighter when received at the range loading point than in previous years. After a preliminary feeding period the lambs went on the initial tests weighing about 64 pounds.

Feed Prices:

Westland Milo	\$ 2.00 per cwt.
Alfalfa	25.00 per ton
Current year's Axtell Stover	7.00 per ton
One-year-old Axtell Stover	5.00 per ton
Two-year-old Axtell Stover	5.00 per ton
Axtell Tailings	7.00 per ton
Soybean oil meal pellets	86.00 per ton
Salt	.90 per cwt.
Ground limestone	1.00 per cwt.
Bicarbonate of Soda	4.85 per cwt.
Wheat Pasture	.30 per head per month

Thirteen of the 642 lambs died during the experimental feeding periods, a loss of 2 per cent. Six of these lambs died during the period that they were grazing on wheat pasture and seven died during the tests in the feedlot.

WHEAT PASTURE LAMB FEEDING EXPERIMENT

Table I—November 6, 1950 to December 15, 1950—39 Days

1. Lot number	1	2	3	4	5	6
	Westland grain Alfalfa Axtell Stover Soybean pellets Limestone Salt	Wheat pasture No salt	Wheat pasture Salt	Wheat pasture Alfalfa hay Salt	Wheat pasture Salt Vaccinated against entero- toxemia	Wheat pasture Soda Salt
2. Ration fed						
3. Number lambs per lot	50	118	118	119	119	118
4. Number of days on feed	39	39	39	39	39	39
5. Initial weight per lamb	64.4	64.7	64.3	64.9	64.2	64.5
6. Final weight per lamb	79.5	75.4	74.5	76.4	74.8	75.7
7. Total gain per lamb	15.1	10.7	10.2	11.5	10.6	11.2
8. Daily gain per lamb .....	.39	.27	.26	.29	.27	.29
9. Feed per lamb daily						
Wheat pasture		W.P.	W.P.	W.P.	W.P.	W.P.
Milo grain	1.00					
Alfalfa hay	1.34			.16		
Axtell Stover .....	.75					
Soybean oil pellets .....	.20					
Ground limestone .....	.005					
Soda .....						.0014
Salt .....	.013		.013	.014	.013	
11. Feed cost per cwt. gain	\$12.50	\$4.14	\$4.13	\$4.51	\$3.95	\$4.25
12. Initial cost per lamb into feed lot*	\$15.73	\$15.80	\$15.70	\$15.85	\$15.83**	\$15.75
13. Feed cost per lamb	\$1.88	.44	.42	.52	.42	.48
14. Lamb cost plus feed cost	\$17.61	\$16.24	\$16.12	\$16.37	\$16.25	\$16.23
15. Final cost per cwt.	\$22.15	\$21.53	\$21.63	\$21.42	\$21.72	\$21.44
16. Death loss by lots	0	2	1	0	1	2

* Based on lambs finishing test.

**Includes 15 cents for vaccination.

FEEDLOT TESTS

Table II—December 18, 1950 to March 20, 1951

1. Lot number	1 ¹	2 ²	3 ²	4	5	7
	Westland grain Axtell Stover Soybean pellets Limestone Salt	Westland grain Axtell Stover Soybean pellets Limestone Salt	Westland grain Axtell Stover Soybean pellets Limestone No salt	Westland grain Axtell Stover Soybean pellets Limestone Salt Drenched	Westland grain Axtell Stover Soybean pellets Limestone Salt	Westland milo grain Alfalfa hay
2. Ration fed						
3. Number of lambs per lot	50	55	55	55	55	55
4. Number of days on feed	92	92	92	92	92	92
5. Initial weight per lamb	79.4	74.5	74.4	75.0	75.4	75.4
6. Final weight per lamb	87.2	87.3	83.1	83.7	85.0	93.5
7. Av. weight of shorn fleece	6.6	6.7	6.6	6.9	6.6	7.3
8. Total gain per lamb	14.4	19.5	15.3	15.6	16.2	25.4
9. Daily gain per lamb .....	.16	.21	.17	.17	.18	.28
10. Feed per lamb daily						
Milo grain	1.22	1.17	1.17	1.17	1.17	1.17
Alfalfa hay						
Axtell Stover	2.14	2.26	2.24	2.23	2.27	2.32
Axtell tallings						
Soybean oil pellets .....	.20	.20	.20	.20	.20	—
Ground limestone .....	.017	.016	.016	.016	.016	—
Salt .....	.027	.025	—	.026	.026	.026
11. Feed cost per cwt. gain	\$26.09	\$19.60	\$24.52	\$23.724	\$23.16	\$19.12
12. Initial cost per lamb into feed lot ³	\$17.93	\$16.63	\$16.32	\$16.31	\$16.54	\$16.25
13. Feed cost per lamb	\$3.76	\$3.82	\$3.75	\$3.70	\$3.75	\$4.86
14. Lamb cost plus feed cost	\$21.69	\$20.45	\$20.07	\$20.01	\$20.29	\$21.11
15. Final cost per cwt.	\$23.12	\$21.75	\$22.37	\$22.09	\$22.15	\$20.94
16. Death loss by lots	1	2	1	0	1	0

1 Lot 1 had been on feed in the dry lot since November 6 and therefore are not directly comparable to the other lots that were made up of lambs previously run on wheat pasture.

2 The lambs making up lots 2 and 3 received no salt while on wheat pasture.

3 Death loss charged into this cost in lots where lambs died.

4 Includes cost of drenching.

FEEDLOT TESTS

Table III—December 18, 1950 to March 20, 1951

1. Lot number	8	9	10	11	12
	Westland grain Alfalfa Axtell Stover Soybean pellets Salt	Westland grain 2-yr.-old Axtell Stover Soybean pellets Limestone Salt	Westland grain 1-yr.-old Axtell Stover Soybean pellets Limestone Salt	Westland grain Axtell tailings Soybean pellets Limestone Salt	Westland grain Axtell Stover Soybean pellets Limestone Salt Axtell tailings
2. Ration fed					
3. Number of lambs per lot	55	55	55	55	55
4. Number of days on feed	92	92	92	92	92
5. Initial weight per lamb	75.2	74.5	75.2	74.8	76.0
6. Final weight per lamb	93.5	80.9	81.9	84.0	85.5
7. Av. weight of shorn fleece	6.7	6.2	5.9	6.2	6.6
8. Total gain per lamb	25.0	12.6	12.6	15.4	16.1
9. Daily gain per lamb .....	.27	.14	.14	.17	.18
10. Feed per lamb daily					
Milo grain	1.17	1.17	1.17	1.17	1.17
Alfalfa hay	1.08	—	—	—	—
Axtell Stover ..	1.08	1.48	1.48	—	1.66
Axtell tailings ..	—	—	—	2.03	1.67
Soybean pellets	0.90	0.20	0.20	0.20	0.20
Limestone	0.10	.016	.016	.016	.016
Salt .....	.029	.026	.026	.026	.026
11. Feed cost per cwt. gain	\$17.74	\$26.70	\$26.18	\$23.96	\$23.42
12. Initial cost per lamb into feed lot	\$16.21	\$16.34	\$16.21	\$16.41	\$16.38
13. Feed cost per lamb	\$4.43	\$3.36	\$3.30	\$3.69	\$3.77
14. Lamb cost plus feed cost	\$20.64	\$19.70	\$19.51	\$20.10	\$20.15
15. Final cost per cwt.	\$20.60	\$22.62	\$22.22	\$22.28	\$22.34
16. Death loss by lots	0	1	0	1	0

SUMMARY

Wheat Pasture Tests

Gains on wheat pasture during the 39 day grazing period ranged from .26 pound per head daily to .29 pound. While gains are not as high as those obtained last year, the results are similar to those obtained in other tests conducted on wheat pasture.

Lambs fed in the drylot gained considerably more than lambs fed on wheat pasture but the cost per pound of gain in the feedlot was about three times the cost of gains on wheat pasture.

Lambs fed no salt on wheat pasture gained just as well as those having access to salt. It is probable that the grazing period was too short to show any ill effects of a diet containing no supplemental salt.

There was an indication that the addition of a small amount of alfalfa hay to wheat pasture increased the rate of gain but the cost per pound was also increased.

No losses occurred from over-eating disease or digestive trouble during the grazing period; therefore it was impossible to check the efficiency of either vaccination or soda in their control.

SUMMARY

Feedlot Tests

Feedlot gains shown in Tables II and III are much lower than in previous years when apparently similar lambs and similar feeds were used in the tests. The lambs were shorn the last week in February and may have been affected by some of the stormy weather occurring during early March. The final weights used in determining the amount of gains were taken on March 20. While conditions were apparently normal, weights taken six days later showed an average increase in weight per lamb of about seven pounds, indicating that the March 20 weights were lower than normally would be expected. However, all lots were weighed under similar conditions on that date so that comparisons between the various lots should not be biased.

Alfalfa fed as the sole roughage or replacing one-half of the sorghum roughage produced larger and more economical gains than the sorghum roughages. Alfalfa and Axtell stover, equal parts, produced slightly lower gains but at less cost per pound of gain than alfalfa as the only roughage.

The low gains of lot 3 indicate that salt is needed for good gains when the feeding period is of 130 days duration.

Drenching for worm control was ineffective in increasing the rate of gain. The drenched lambs appeared to be affected adversely by the drench and failed to gain the first 14 days of the feeding period.

One-year-old and two-year-old Axtell stover produced the lowest gains of any of the lots and at the highest cost per pound of gain. Chemical analyses failed to show much difference in sorghums grown the current year and the older Axtell stover but the lambs did not relish the older stover and would not consume as much roughage.

Axtell tailings or "pummies" appeared to be virtually equal to Axtell stover in feeding value. About the same rate of gain was obtained when the tailings were fed as the sole roughage as when they were fed in equal parts with Axtell stover.

PHYSICAL BALANCE IN SHEEP FATTENING RATIONS

THE RELATIONSHIP OF PHYSICAL BALANCE AND ENERGY VALUE IN SHEEP RATIONS STUDIES CARRIED OUT AT THE KANSAS AGRICULTURAL EXPERIMENT STATION MANHATTAN, KANSAS

by

T. Donald Bell, Rufus F. Cox, J. S. Hughes

Lamb fattening rations varying in physical nature but virtually alike chemically have been studied at the Kansas Agricultural Experiment Station for a number of years. Previous tests have demonstrated