

GRADUATING THESIS.

THE SHEEP INDUSTRY IN KANSAS.

BY

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A survey of the history of the sheep industry in Kansas reveals some interesting facts that are difficult to explain. At the close of the year 1872 there were according to carefully compiled statistics 39773 sheep in the state. This number gradually increased until in 1878 there were 243,760, in 1880 426492, and in 1883 the maximum number, 1,154,196 was reached. Then commenced a steady decrease in the number of sheep within the border of our state, and although the valuation of all live stock increased during the eighteen years beginning in 1883 and ending 1901, from 104 million to 155 million dollars, and the value of live stock products from 32 million to 74 million dollars, we find at the close of the year 1902 only 136,743 sheep in the state of Kansas.

During the eighteen years above mentioned the number of milch cows was doubled, the number of other cattle doubled, the number of horses doubled, and the number of swine greatly increased. There were, however, only one-ninth as many sheep in the state in the year 1902 as were present in 1883. Since the year 1902 the number has begun to increase, and according to the report of 1904 there were more than 167 thousand sheep in Kansas.

Since the live stock statistics of other states reveal no such fluctuation in the number of sheep as do Kansas statistics, there would seem to be some peculiarity in the conditions found in our state that renders sheep raising and sheep feeding unprofitable.

Just what this peculiarity is a careful study of existing conditions fails to explain, and this leads one to the conclusion that there is in reality nothing to prevent the farmers and stockmen from

handling more sheep than they are now handling. Having arrived at this conclusion the reasoning followed to reach it will next be considered.

First let us note the conditions found in Kansas, and compare them with those found in neighboring states where sheep are profitably raised and fattened. In order to make this comparison as conclusive as possible four states situated respectively northeast, southeast, northwest and southwest of Kansas will be considered. The states chosen are Iowa, Georgia, Wyoming and New Mexico. In this comparison the climate, soil, altitude and also the feeds raised in the several states will be taken into account.

We find in Kansas a moderately dry climate with a large proportion of sunny days in each year. The average mean temperature is about 55° . Wide extremes of temperature are found ranging from 110° to -20° . Sudden changes in the weather are of frequent occurrence. The average rainfall of the state is about 27 inches. The altitude of Kansas varies from a height of 750 feet in the eastern section to 4000 feet in the western part. The feeds raised in the state consist chiefly of corn, Kafir corn, barley and oats as concentrates, and of wild hay, alfalfa, sorghum, and corn stover as roughage. The soil of Kansas is well drained and consists chiefly of loam, sand and clay. The surface of the state is, broadly speaking, inclined to be rolling.

In the state of Iowa the mean temperature is about 4° lower than it is in Kansas, and the variations in temperature are as wide and the changes as sudden. The average rainfall is about 30 inches per annum. The altitude of the state is about 1000 feet above the sea level. The formation of the soil in Iowa is not different from that of Kansas. Except for the fact that the blue-grass thrives better

in Iowa than in Kansas and barley and Kafir corn grow better in Kansas than in Iowa the crops of the two states are practically the same.

The state of Georgia has an average mean temperature of about 65° . Wide extremes of temperature and sudden changes are rare. The average rainfall of the state is about 49 inches per annum. The elevation varies below 2000 feet above the sea level. The state has in many localities a rather rough, uneven surface, but the soil shows no wide variation from that of Kansas. Cereals are not raised extensively in Georgia, cotton being the main crop, but notwithstanding this fact there are more than twice the number of sheep in the state than are found in Kansas.

Wyoming, in the northwestern part of the U.S., has an average mean temperature of 46° , and wide extremes ranging from 116° to -46° . The annual rainfall averages about 13 inches, a large proportion of sunny days being the rule. The state has an elevation of from five to seven thousand feet above the sea level, and the surface presents a wild broken appearance. Cereals are not raised in the state to any extent but in the year 1900 there were more than five million sheep in Wyoming.

New Mexico, situated in the southwestern part of the U.S., has a very rough, uneven surface. Nearly all of the state has an altitude of more than four thousand feet above the sea level. The average mean temperature is about 50° . Wide extremes and sudden changes of temperature are the rule. The average rainfall is about 15 inches per annum, hence cereals are raised in limited quantities. In spite of this fact however, there are within the border of the state today more than three million sheep.

A careful scrutiny of the conditions found in the several states

compared does not reveal a single reason why sheep-raising has not been given more attention in Kansas. We find sheep doing well and yielding a profitable return on the gently rolling or level plains of Iowa where the rainfall is medium and the extremes of temperature are wide, in Georgia where the climate is hot and the rainfall heavy, in Wyoming where the climate is cold and the country rough and in New Mexico where there is a light rainfall and in many localities a hot climate.

Investigating further and confining ourselves to Kansas itself, we can find nothing in the livestock statistics to explain why sheep have been so neglected. On first thought it might be supposed that sheep have not thrived in the state, but records show that the mortality among sheep (including those killed by dogs and wolves) is less in proportion to the total number, than is true of any other class of livestock. The decline in numbers must be due then to some reason other than lack of thrift on the part of the animals themselves.

A glance over the statistics of other states will explain in part why the number has so diminished, for we find a general decline in the number of sheep in the whole country. This general decline in numbers is easily explained by calling attention to the fact that wool was quoted low on the markets at the time when sheep began to diminish in numbers, but just why the number should diminish in such larger proportion in Kansas than in other states is a question that cannot be answered with certainty.

The best explanation seems to be that Kansas is so well adapted to swine and cattle raising that sheep have not received the share of attention due them. Another reason for the scarcity of sheep in the state that should perhaps be considered, is the lack of steadiness in the mutton market. It would seem that the beef and mutton

markets would be nearly parallel at all times, and that anything that would change one would change the other. The fact that each product is a good substitute for the other would also tend to keep the prices of the two in equilibrium. But contrary to these facts the mutton market has shown a wide range in prices and this variation has not been parallel to, or governed by the beef market.

The old economic rule that supply and demand govern price must have its application to the mutton market, but whether the demand regulates the supply, or the supply the demand, is a question that is not easily answered. It seems though, that as long as beef and pork are plentiful, a supply of mutton must first be furnished in order to create a demand, and that that demand once put into operation will regulate the supply and govern the price.

Since the sheep is practically the only wool producing animal and the demand for wool is constant the number and kind of sheep in all countries must determine the price of wool, since this product is easily shipped and practically non-perishable.

Assuming then as we logically may that there is already created in our western markets a lively demand for mutton, and assuming also that there is nothing in Kansas conditions to prevent the state from being one of the leading sheep states in the Union, we will pass to a brief discussion of the reasons why the average Kansas farmer should keep a breeding flock.

While it is true that specialized farming and stock-raising have in many instances made larger fortunes than general farming, it is also an undisputed fact that diversified farming is safer than specialized farming. For the same reason that the farmer plants several crops in order to insure good results from one he should raise several kinds of live-stock and thus distribute his investments.

Moreover, sheep have a real place in Kansas agriculture that the progressive farmer of today cannot afford to overlook.

The sheep is an economical feeder. He does not as a rule produce as many pounds of gain per hundredweight of grain as does the hog, but this lack is in most cases more than compensated for by the wider variation between the prices of feeding and fat sheep than there is between the prices of feeding and fat swine. Another quality that must be credited to sheep is that they readily adapt themselves to a large proportion of grain and a small proportion of roughage, or vice versa. When grain is plentiful it may be fed with profit to sheep, but when it is scarce and high in price they may be fattened on green forage alone, which is not true of any other class of animals.

Sheep should also have an important part to play in maintaining the fertility of many Kansas farms. Every year is showing more and more the necessity of adding plant food to the soil, and experiments have shown conclusively that barn-yard manure is the cheapest and most effective fertilizer known. The various classes of stock all help to supply this need, and they also vary widely as to usefulness in this respect. If the many classes of farm animals were ranked according to their degree of usefulness in this respect, sheep would stand first in the list. The reasons for this assertion are that sheep eat more weeds than any other class of stock, they return more nitrogen to the soil in proportion to the food they eat than do any other animals, and they distribute the manure more evenly and trample the ground less than is true of any other class of livestock.

Another use to which sheep can be put is the furnishing of fresh meat in the summer. A mutton is quickly and easily dressed and is

not so large that it must be smoked, dried or put away in brine in order to preserve it. If a supply of ice is available a dressed lamb may be kept fresh until it can be consumed by a family of average size.

Again, a small breeding flock of sheep, like a flock of poultry, can be maintained on feed that would otherwise be wasted. The flock can be used for clearing an orchard of weeds and for keeping down weeds in a patch of timber, a corral, garden or stubblefield, and at the same time be making for themselves a living and yielding their owner a handsome profit.

Aside from the sheep that are raised in Kansas there are now being fattened large numbers of lambs from the western ranges and this practice bids fair to increase rapidly. In the fall of the year the grass on the ranges of Wyoming, Colorado and New Mexico begins to dry, and the lambs must be sold and removed to some portion of the corn belt to be fattened. Kansas feeders can handle these sheep with greater profit than can the feeders of any other state. Grains such as fatten sheep with minimum cost are raised in the state, the railroad accommodations are good, both from the ranges to the various feeding points and from these points to Kansas City, which is the best mutton market west of the Mississippi. Kansas feeders have also the great advantage of being close to market, and it is a well known fact that fat sheep shrink heavily if shipped long distances. With conditions as they are today Kansas sheep feeders are making large profits, but when they become more acquainted with the value of rape and other green forage plants that can be planted after the small grains, and furnish sheep pasture, they will no doubt accomplish even better results.

Some idea of the results that may be obtained from feeding

sheep can be given by the following table which shows the result of a feeding experiment conducted at this station during the winter of 1905 and 1906:

| Lot no. | Wt. at beginning | Wt. at end. | Total gain. | Av. daily gain. | Grain per cwt. gain. | Roughage per cwt. gain. | Feeds. |
|---------|------------------|-------------|-------------|-----------------|----------------------|-------------------------|---|
| 1 | 58.0 | 80.0 | 22.0 | .328 | 419.3 | 536.3 | Kafir corn & alfalfa. |
| 2 | 62.1 | 84.6 | 22.5 | .335 | 404. | 522.2 | Corn & alfalfa. |
| 3 | 55.2 | 77.8 | 22.0 | .337 | 412.6 | 549.7 | Emmer & alfalfa. |
| 4 | 58.4 | 84.4 | 26.0 | .388 | 351.3 | 458.8 | Barley & alfalfa. |
| 5 | 59.4 | 72.0 | 12.6 | .188 | 614.3 | 744.8 | Corn & prairie hay. |
| 6 | 58.8 | 80.4 | 21.6 | .322 | 385.8 | 523.2 | Corn & brome hay |
| 7 | 57.1 | 81.2 | 24.1 | .359 | 378.9 | 459.7 | Corn, cotton-seed meal & alfalfa. |
| 8 | 62.0 | 86.8 | 24.8 | .370 | 386.9 | 462 | Kafir corn, cotton-seed meal & alfalfa. |
| 9 | 62.6 | 85.6 | 23.0 | .343 | 397 | 449.5 | Corn chop, blood meal & alfalfa. |
| 10 | 61.2 | 74.2 | 13.0 | .194 | 234.6 | 1873.8 | Kafir corn & soy beans cut. |

The lambs were from the western ranges and represented fairly the class of sheep that usually come off the range. The feeding period was 65 days.

In justice to the sheep in lot number 10 it must be said that the soy bean hay was unusually coarse, as was also the Kafir fodder, since the latter was planted for the purpose of obtaining a maximum grain yield.

Lots 5 and 6 fed respectively prairie hay and brome hay for roughage with corn as a grain ration, did not make large or economical gains, which fact is easily accounted for by the lack of protein in the ration. In lot number 5 especially there was from time to time an inclination for the animals to have slight attacks of scours, which must have been due to indigestion, since the feed given was not of a laxative character. Satisfactory results are not to be expected from such a combination of feeds, and one of the purposes of this experiment was to show the difference in the gains of lambs fed on such a ration, and those fed on a desirable combination of common Kansas feeds.

Lots 1, 2, 3 and 4 are the ones that deserve special attention, since the rations given them are easily compounded and can be fed to large numbers of sheep with a minimum cost of labor. It is also seen that they have the advantage of having the roughage ration consist entirely of alfalfa, which is the cheapest source of protein in Kansas. All of these rations, as the tables show, gave satisfactory results and when we remember that the profits on western lambs can be greatly increased by early fall feeding in which green forage is utilized, we can see at once that lamb feeding in Kansas can be made extremely profitable.

As before stated our state is admirably adapted to swine and cattle raising, but the dry climate of western Kansas is certainly ideal for sheep raising and feeding. The two drouth resisting crops Kafir corn and barley can be grown here in abundance. The state is just between a feeding sheep market and a mutton market, and there is but little doubt that the farmers and stockmen of Kansas will soon see and use these natural advantages of climate and situation.

It is true of many new enterprizes that the men who have built

them up, are the ones who have received the largest compensation for their work, and there is little room to doubt that the men who are foremost in promoting the sheep industry in this state will be well repaid for their efforts besides being instrumental in adding materially to the wealth and happiness of the people of Kansas.