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UNIVERSITY OF MISSOURI

COLLEGE OF AGRICULTURE AND MECHANIC ARTS

Agricultural Experiment Station

BULLETIN NO. 79

**GREEN FORAGE FOR HOGS**

**A COMPARISON OF THE FEEDING VALUE OF**

- (a) **Corn and Ship Stuff**
- (b) **Corn and Alfalfa**
- (c) **Corn and Clover**
- (d) **Corn and Rape**
- (e) **Corn and Bluegrass**
- (f) **Corn and Skim Milk**

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# University of the State of Missouri

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# Agricultural Experiment Station

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## VALUE OF DIFFERENT KINDS OF GREEN FORAGE FOR HOGS.

By H. J. WATERS, *Director.*

Perhaps the largest single waste occurring on the Missouri farm at the present time is that which comes from the too exclusive use of corn in growing and fattening hogs. The cheapest and most easily applied remedy is a more general use of the proper forage plants in summer and the use of some home grown protein in winter. It is not of course to be denied that the hog is primarily a grain consuming animal, at the same time forage plays an important role in economical hog production and deserves far more attention than it has yet received. To secure accurate information on this point, this Station undertook some time ago to compare the value of various forage plants when combined with corn for the growing and fattening of hogs.

### Details of the Experiment.

Six lots were fed. Each lot contained six high grade Poland China pigs, weighing about 50 pounds each. The rations were as follows:

- Lot I. Corn meal three parts; ship stuff two parts.
- Lot II. Corn Meal; Fresh Rape.
- Lot III. Corn Meal; Fresh Alfalfa.
- Lot IV. Corn Meal; Fresh Red Clover.
- Lot V. Corn Meal; Fresh Bluegrass.
- Lot VI. Corn Meal one part; Skim Milk three parts.

The feeding experiment covered a period of 102 days, beginning July 25, 1902, and continuing until November 4, 1902.

Each lot was confined in a separate pen, on a granitoid floor, with a shed for protection against the sun and heat.

The green forage was fed in a separate trough twice daily, immediately after being cut, the same being carefully weighed, and given in such quantities as the hogs would eat without waste.

The corn meal was of medium fineness, was mixed with water to the consistency of a thick dough, and was fed twice daily in such quantities as would be eaten without waste. In the case of Lot I, having corn meal and skim milk, the meal was wet with the milk instead of with water. Otherwise they were all fed in the same manner.

The rape was large and coarse, and only the fresh green leaves were fed.

The alfalfa, until August 12th, about the middle of the experiment, was rather too mature and coarse to be relished by the hogs, and was fed just as it came from the field, stems, leaves, etc. After the 12th of August the alfalfa was of fairly satisfactory quality.

The red clover and bluegrass were both young and tender until late in the season, about the last thirty days, when they were both rather too mature and coarse for the best results. Especial care was exercised to secure bluegrass free from white clover or other legume.

The green material was offered twice daily, night and morning, as was the grain.

Salt, mixed with wood ashes and with a small amount of finely ground bone meal, was kept in a separate trough before each lot constantly.

The hogs were watered twice daily with deep well water, and the pens were kept clean and sanitary.

It was not expected that in ordinary farm practice the green material would be cut and fed to the hogs in this manner. At the time the experiment was undertaken, however, it was not feasible to fence off areas of each of these forage crops and

graze them; besides, to know what amount of each of these green forage crops was consumed by hogs when full fed on corn was deemed to be information of importance both from a practical and a scientific standpoint. Outside of the extra expense required for cutting and hauling this material to the hogs, it was not considered that they would do so well on this material as if allowed to graze, for when grazing they would be able to select their material and would eat a larger quantity of forage than it was possible to get them to consume in a pen when it was cut and fed to them in the manner described. It is safe, therefore, to assume that our experiments show the minimum advantage of these forage crops and that in actual practice a larger benefit would accrue from the use of these materials than our experiments show.

The following tables present a summary of the data:

PERIOD I. July 25th to September 3.—40 days.  
(At end of this Period, Rape was exhausted.)

Lot	Ration	Weight at beginning. Lbs. ....	Weight at close. Lbs. ....	Total gain in weight per lot. Lbs.	Grain eaten. Lbs. ....	Forage eaten. Lbs. ....	Average daily gain per pig. Lbs. ....	Grain per pound gain. Lbs. ....	Cost* per pound gain. Cts. ....
I.	Corn Meal Middlings .....	290	437	147	719		.61	4.89	3.99
II.	Corn Meal Rape .....	284	422	138	609	172	.58	4.41	3.34
III.	Corn Meal Alfalfa .....	283	460	177	608	159	.74	3.43	2.59
IV.	Corn Meal Clover .....	295	452	157	608	139	.65	3.87	2.89
V.	Corn Meal Blue Grass .....	271	411	141	617	138	.60	4.37	3.27
VI.	Corn Meal Skim Milk .....	283	650	367	685	2056	1.53	1.86	2.17

\*Corn Meal, 40c per bushel of 56 pounds.  
Middlings \$18.00 per ton.  
Green Forage \$3.00 per ton.  
Skim Milk 15c per 100 pounds.

RESULTS OF ENTIRE EXPERIMENT.

(Rape lot omitted)

July 25th to November 4th—102 days.

Lot	Ration	Weight at beginning. Lot... lbs.	Weight at close. Lot... lbs.	Total gain per lot. lbs. ....	Total grain eaten per lot. lbs. ....	Total forage eaten per lot. lbs. ....	Average daily gain per pig. lbs. ....	Grain per pound gain. lbs. ....	Cost per 100 lbs. gain \$.....
I.	Corn Meal Middlings . . . . .	290	707	417	2163		.68	5.18	4.07
III.	Corn Meal Alfalfa . . . . .	283	793	510	2049	463	.83	4.01	3.00
IV.	Corn Meal Clover . . . . .	295	766	471	2049	440	.77	4.35	3.25
V.	Corn Meal Bluegrass* . . . . .	271	658	387	2058	436	.63	5.31	3.96
VI.	Corn Meal Skim Milk . . . . .	283	1269	986	2396	7189	1.61	2.43	2.83

\* Bluegrass free from white clover, and always fresh. In fall, however, when blades were long it was not so tender and palatable as earlier, and hogs did not eat so much and did poorer than before.

For a comparison of the feeding value of Rape with the other green forage plants, see the preceding table giving the results of the first period of the experiment.

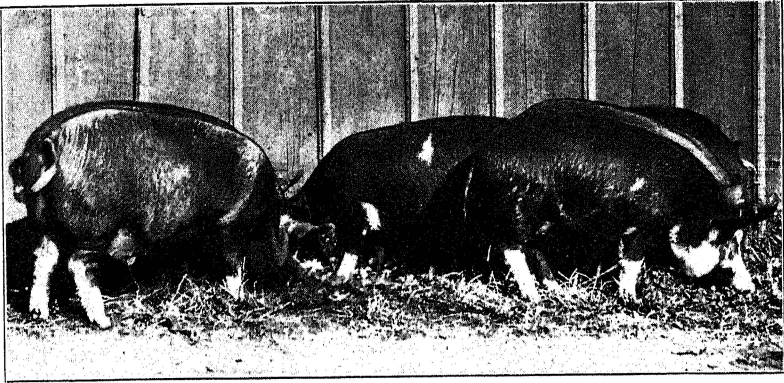


**LOT I. CORN MEAL THREE PARTS; SHIP STUFF TWO PARTS.**

Average daily gain per head, .67 lbs.

Grain required per pound of gain, 5.18 lbs.

Cost per 100 pounds of gain, with corn at 40 cents per bushel, ship stuff, \$18.00 per ton, \$4.07.



**LOT II. CORN MEAL AND GREEN RAPE—**  
(First 40 days of experiment only)—

Average gain per head, .58 lbs.  
Grain required per pound of gain, 4.41 lbs.  
Cost per 100 lbs. of gain with corn at 40 cents per bushel and  
Green Rape at \$3.00 per ton, \$3.34.

It will be noted that by using clover instead of bluegrass a difference of nearly 75c per hundred in the cost of gain was effected.

When alfalfa was used instead of bluegrass, the saving was nearly \$1.00 per hundred.

When skim milk was used instead of the forage, the cheapest and most rapid gains were made.

When it is noted how much cheaper the gains were made on corn and clover than those made on corn and ship stuff, for example, the folly of feeding such a ration in the summer-time, when a green forage might just as well be available, is apparent.

When we realize, moreover, that clover will give a larger yield of forage than bluegrass, and when we consider its superior feeding value, it is perfectly obvious that a material increase is made in the pounds of pork per acre of our land or per bushel of corn fed, by providing the hogs with clover pastures instead of requiring them to run on bluegrass, or even not so good as bluegrass, a timothy pasture, or even worse than this, by confining them in a dry lot.



### LOT III. CORN MEAL; FRESH ALFALFA.

Average daily gain per head, .83 lbs.

Grain required per pound of gain, 4.01 lbs.

Cost per 100 pounds of gain, with corn at 40c. per bushel,  
Fresh Alfalfa, \$3.00 per ton, \$3.00.

It should not be understood that bluegrass pasture during the time white clover has possession of the ground is not highly acceptable as a hog pasture. At this particular season of the year an ordinary bluegrass pasture, especially in those seasons when white clover does well, can scarcely be excelled. But before the white clover comes on and after it has passed away, the ordinary bluegrass pasture does not begin to compare in value with a pasture of red clover or alfalfa.

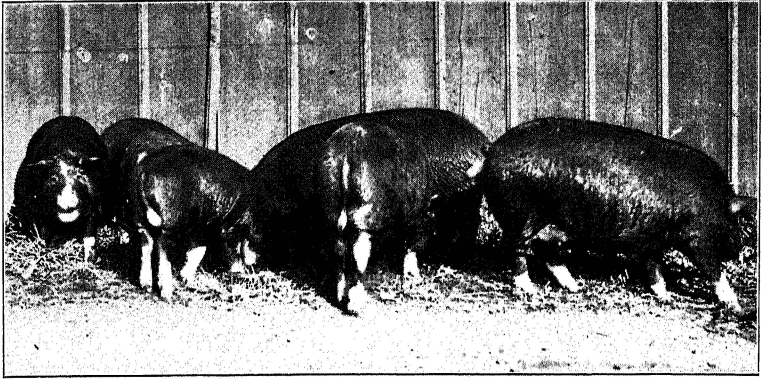
### Red Clover and Alfalfa Compared.

It will be noted that alfalfa showed a superiority over red clover as a forage for hogs in both periods of the trial. The cost per 100 lbs. of gain was as follows:

*First Period.* Corn and Alfalfa, \$2.59. Corn and red clover, \$2.89. Difference, 30c. per hundred.

*Whole Period.* Corn and Alfalfa, \$3.00 per hundred. Corn and red clover, \$3.25. Saving from use of alfalfa, 25c per hundred.





**LOT IV. CORN MEAL; FRESH CLOVER.**

Average daily gain per head, .77 lbs.

Grain required per pound of gain, 4.35 lbs.

Cost per 100 pounds of gain, with corn at 40c. per bushel, and Fresh Clover at \$3.00 per ton, \$3.25.

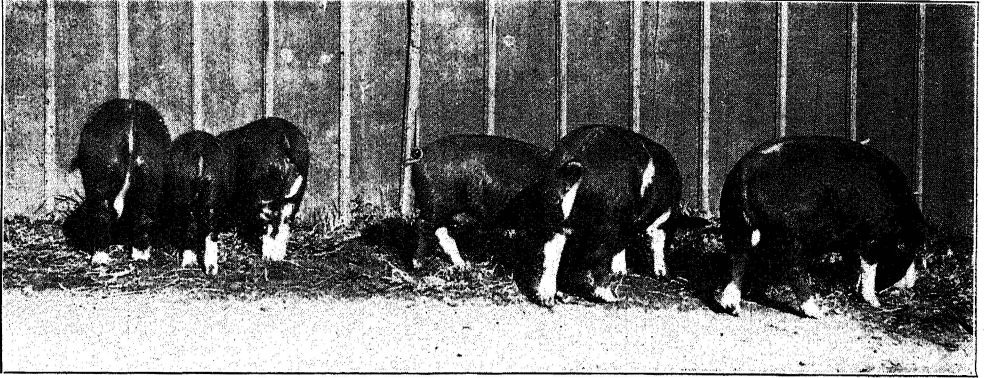
This means a difference on the basis of a 250-lb. hog of 62 1-2c. or about \$37.00 on each carload of hogs, or more than enough to pay the freight, even if the yield of the two crops is to be counted the same.

Of more importance than the superiority of the feeding value itself is the fact that the alfalfa will yield a much larger amount of pasture than will red clover, and that it will come on earlier and remain green later than clover, and will, if kept clipped, remain green throughout the summer and therefore afford a green pasture of succulent material which the hogs will relish most highly.

It is believed to be possible to grow enough alfalfa for hog pasture at least on practically every farm in Missouri.\* Until, however, alfalfa, is an assured success on every farm, the farmer ought to arrange for a clover pasture for his hogs every year without fail.

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\*As to the best method of seeding and growing alfalfa, the reader is referred to Bulletin 72 of the Missouri Experiment Station, on Alfalfa Growing, by Prof. M. F. Miller.



**LOT V. CORN MEAL; FRESH BLUEGRASS.**

Average daily gain per head, .63 lbs.

Grain required per pound of gain, 5.31 lbs.

Cost per 100 pounds of gain, with corn at 40c per bushel, and Fresh Bluegrass at \$3.00 per ton, \$3.96.

**A Succession of Pastures for Hogs.**

It is not safe or even desirable to rely upon a single crop, excepting alfalfa where it is an assured success, to furnish pasture for our hogs throughout the entire season. It is better to arrange for a succession of pastures from the beginning of the season until the hogs are ready for market, making the feed richer and more concentrated toward the close of the season and as we approach the finishing or fattening period. For this purpose the following crops are recommended:

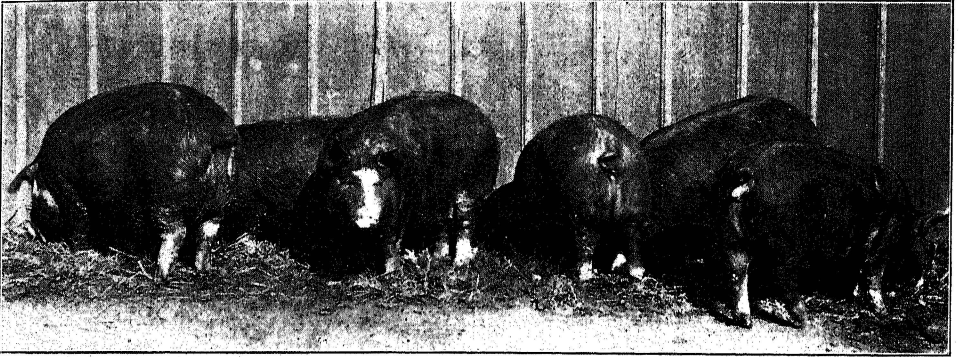
Red clover or alfalfa.

Cowpeas.

Soy Beans.

**Cowpeas.**

To provide a crop of cowpeas in the best condition for the hogs, it will be necessary to select some very early maturing sort and sow rather earlier than is advised for a general crop. For this purpose the New Era, Sherman's Northern Prolific or Warren's Extra Early are recommended, to be sown about the middle of corn planting time in rows about thirty inches



**LOT VI. CORN MEAL; SKIM MILK.**

Average daily gain per head, 1.61 lbs.

Grain required per pound of gain, 2.43.

Cost per 100 pounds of gain, with corn at 40c. per bushel, and skim milk at 15c. per 100 lbs., \$2.83.

apart and cultivated shallow and level as often as is necessary to hold the weeds in check. For the best results the hogs should not be turned on the peas until the first pods are turning yellow. They will, however, make good pasture before this time, and if the hogs are needing pasture it is not advised to wait until that stage of maturity. A larger area of cowpeas for hogs should be sown about the end of corn planting time, and for this purpose the Whippoorwill variety is to be recommended, or a second sowing of the New Era may be made. These may be sown broadcast and covered with a spring tooth harrow, or what is better, sown with a grain drill letting all hoes run, using from a bushel to a bushel and a half of seed to the acre. They will require no subsequent cultivation and will come on about the time the earlier varieties mentioned have been eaten down. It is considered still better and more economical of seed to sow in rows and cultivate as above suggested.\*

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\*For a full discussion of cowpea varieties and the best method of growing this crop, see Missouri Experiment Station Bulletin 73, by Mr. A. E. Grantham.

## Soy Beans.

As a grain crop to use in connection with corn for crowding the spring crop of pigs to market, the soy bean is a very valuable crop. It is essentially a grain plant, very rich in protein, and while the hogs are running on soy beans they should have access to corn to balance the ration. While the corn does not contain enough protein for the best results, soy beans contain more than is profitable to feed, and the combination of the two grains is therefore much better.\* The soy bean matures about the same time as a medium early corn, like Reid's Yellow Dent, and the two crops could be grown in the same field so that the hogs could have access to both without further labor. If this is not feasible, the corn should be thrown to the hogs every day. The early yellow variety is recommended, sown in drills about thirty or forty inches apart, using about three pecks to the acre, and cultivate shallow until the plants completely shade the ground. The hogs should be turned in when the first pods begin to ripen.

The soy bean is regarded as somewhat better adapted for finishing a bunch of hogs than the cowpea; at the same time if one does not care to bother with so many different crops, the cowpea may be used instead with satisfactory results.

For brood sows in winter and very early spring, it is always advisable to give them access to a piece of early sown wheat or rye, and to let them have a limited amount of nicely cured clover, alfalfa or cowpea hay by way of variety of feed. Sorghum stalks grown as is customary for the production of syrup, in limited quantity, make an excellent addition to the ration. The main thing to be avoided in carrying hogs of this sort through the winter is a straight corn diet. The greater the variety of cheap materials like these, the better the sows will do.

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\*For a detailed report of a number of feeding experiments with various grains rich in protein, see Missouri Experiment Station Bulletins 65 and 67, by Professor E. B. Forbes.