REGARDLESS of the breeding or the individuality of the dairy cow, she cannot produce milk in large quantities unless she is properly fed. A great many dairymen lose sight of this fact and provide only scant pasture or a limited amount of hay for their cows.

Milk and the cow's body are composed of certain elements commonly called protein, carbohydrates, fats, and mineral matter. Since feed must supply the necessary elements for developing and maintaining the animal's body and for the production of milk, it is essential that the cow receive a liberal supply of these elements in the form of feed, in the right proportion, a balanced ration.

A good dairy ration besides containing these different elements in certain proportions, should also be succulent, palatable, contain a certain amount of bulk and supply an abundance of vitamins.

There is possibly no one feed as valuable for dairy cows as alfalfa. However, this feed contains more protein as compared to the other elements than is necessary, and a cow of large production cannot consume sufficient alfalfa hay or pasture from which to manufacture the milk which she is capable of producing. Alfalfa hay and corn or sorghum silage or pasture or both silage and pasture with the hay would make a better ration. Under average conditions in the irrigated valleys of the state, it would probably not pay to feed grain to the average dairy cow when she is receiving liberal amounts of the above named feeds. However, for the most economical production, cows of good dairy temperament should generally receive, at least, six to eight pounds of concentrates in addition to all the good roughage they will consume.

A ration composed exclusively of roughage is too bulky to contain sufficient feed elements for continued high production. For instance, alfalfa hay contains about three times as much crude fiber as wheat bran which is bulky for a concentrate and furnishes only about 65 percent as much net energy.

In determining the amount of grain which may be fed to advantage, it will be necessary for the dairyman to bear in mind the productive capacity of their cows and the price of hay as compared to that of grain. Generally where grain does not cost over twice as much per pound as alfalfa hay, some grain can be fed to advantage. By keeping record of the milk produced and the grain fed, one can easily determine the amount of grain which may be fed to advantage. The increase in milk production should be large enough to pay for the additional grain.

High producing cows must have some grain to keep them in good, vigorous condition.

As stated above the dairy ration should provide succulence and provide vitamins in liberal amounts. Both succulence and vitamins are provided in green feed, either in the form of pasture or silage. Silage is succulent, but is deficient in vitamins. Good bright alfalfa hay is fairly high in some of the vitamins but low in others. Most of the grain commonly fed in the state contains only one of the vitamins, A, B and C in liberal quantities.

Succulent feed is valuable because of its beneficial laxative effect, its palatability and it undoubtedly aids digestion.

Although dairy cows have been maintained for several years with little or no green feed this practice is usually uneconomical and also is likely to prove detrimental to the health of the animal. Breeding stock is not likely to develop properly unless provided with a certain amount of green feed.

The best data which we have indicates that the average dairyman in the state should practice some pasturin. The advantages of pasturing are saving in labor, beneficial effect on the health of the animal, and the power of green feed to stimulate milk production.

According to an experiment conducted at the Agricultural Experiment Station at Tucson to determine the value of green feed in the ration of the dairy cow it is very apparent that where cows are not provided with a certain amount of green feed one may expect considerable trouble with retained after-birth and other troubles at calving time, besides a general lack of thriftiness among cows so fed.

Not only does green feed stimulate milk production but it also keeps the digestive system of the animal in such condition that it enhances the value of other feed which may be fed along with the pasture.

Green feed may be supplied by siloing. Some dairymen prefer siloing to pasture. Considerable more feed may be secured from the same amount of ground where siloing is practiced instead of pasturing. However, siloing requires more labor and the price of land and labor would determine which is the most profitable, pasturing or siloing.

Alfalfa and sudan grass provide good summer pasture while the small grains are very satisfactory for winter pasture.

We have discussed briefly the requisites for a good dairy ration, mentioned some of the more desirable feeds for the dairy cow, emphasized the importance of liberal feeding and stated that high producing cows should have some grain. A short discussion of grain mixtures should be appropriate.

In selecting the grains the dairymen should take into consideration the cost of these grains as well as feed value, which means that it is generally advisable to feed home grown grains. Where prices will permit it is advisable to feed a concentrate mixture of several grains because this gives variety to the ration which will likely make it more palatable, provide a better vitamin supply, and the cows are not so liable to tire of the mixture.

A very good grain mixture to feed to high producing cows which are receiving liberal amounts of alfalfa hay and silage would be as follows:

5 parts rolled barley
5 parts ground oats
5 parts corn meal
5 parts wheat bran
3 parts cottonseed meal
1 part linseed meal

Since oats and linseed meal are generally too expensive a more practical mixture would be:
Ground hegari or milo maize could be substituted for either the barley or corn in the above mixture with good results.

Other good grain mixtures for supplementing alfalfa hay, silage and pasture are as follows:

- 350 pounds ground oats
- 400 pounds corn meal
- 175 pounds wheat bran
- 75 pounds cottonseed meal
- 650 pounds corn meal
- 275 pounds wheat bran
- 75 pounds cottonseed meal
- 780 pounds rolled barley
- 180 pounds wheat bran
- 76 pounds cottonseed meal
- 760 pounds ground milo or hegari
- 200 pounds wheat bran
- 50 pounds cottonseed meal

While the last named grain mixtures would not be considered the most desirable mixtures for the greatest possible production they make a good ration and would produce milk more economically than other mixtures which contain concentrates which have to be shipped in.

The amount of concentrates which should be fed will depend on the price of hay, the price of grains, the production of the cow, and the price which the dairyman is receiving for his product. If the grain mixture does not cost more than twice as much per pound as alfalfa hay and a cow is producing one pound of fat, or more, per day, one can likely feed one pound of grain mixture to each four to seven pounds of milk produced for Holsteins, and one pound of grain to each three to five pounds of milk produced by Jerseys. The dairyman should gradually increase his grain allowance and continue to increase the amount of grain fed as long as the milk production increases sufficiently to pay for the increased amount of grain. Cows with high producing ability will not only respond liberally at the pail for the grain consumed but will be in better condition at the next freshening and will produce more milk with their next lactation period.

In conclusion we may say that the average dairyman in the state should feed his cows liberally on alfalfa hay and silage or alfalfa hay and pasture, or alfalfa hay, silage and pasture; and the high producing cows should be fed a desirable grain mixture according to milk production, and a certain amount of green feed should be provided either in the form of soiling or pasture.

Good stock is the main principal in high egg production. An inherited poor hen does not lay heavily, regardless of how much she eats.

THREE AGGIES GRADUATE

Three students, L. J. Finch, Stanley Payne, and Joe Hamilton will graduate from the college of agriculture at the close of the first semester, January 30, 1928. L. J. Finch, a poultry major, is undecided as to what will be his next work. Stanley Payne has accepted a position in connection with the New Beardsley Project which will be developed under the new dam. Joe Hamilton will resume his studies in working for a master's degree. All three of the graduates are members of Alpha Zeta, national honorary agricultural fraternity.

AVOID OVERFEEDING ANIMALS

Overfeeding farm animals is wasteful in many ways. Animals eat more than they need or can digest properly and may have feed in their troughs which they will not eat later. They may also become sick and lose weight from too much feed.

A survey made in Ohio shows that farmers with an agricultural college education earn $5 for every $1 earned by farmers with a common school education only.

Every dairy herd needs a high class bull at its head. A cooperative bull association is the cheapest way to obtain it.