

Supplementing Roughage Feeds

When Necessary, Low Quality Products
Can Be Converted into Usable Forms

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Considerable interest is developing among western cattle feeders in reported tests from Midwest experiment stations that reveal a greater and more efficient use of roughage feeds for cattle than were ever before realized in that part of the country. The results are particularly noticeable since they originate in an important cattle-fattening area where corn is a basic fattening feed.

Just what application to Arizona conditions, if any, can be made of the widely heralded beneficial results from average or low-grade roughages supplemented with specially prepared feed concentrates, is a logical question. An answer to this problem can best be made by first understanding what has caused this improved efficiency in converting high cellulose feeds such as corn cobs, cottonseed hulls, corn silage, corn stalks, and grass silage into highly economical growing rations.

Rumen Fermentation

A new concept has developed in feeding cattle based on evidence that optimum utilization of roughage by the ruminant is dependent upon the proper nourishment of the billions of bacteria that inhabit the paunch of cattle.

Nutritionists have turned to compounding feed concentrate mixtures favorable to the multiplication of the digestion organisms and thereby effect a more complete breakdown of the tough indigestible coarse feeds into more usable form. The nutritive requirements of these paunch bacteria are believed to be similar to the animal needs. They require protein or nitrogen, a good ready source of energy — one which is easily fermentable, and certain vitamins and minerals all in proper balance.

The first and most noteworthy product of this nature became known as the Purdue supplement A. It was originated by Dr. Wm. Beeson, beef cattle nutritionist, Purdue University. The mixture was composed of 64.31% soybean meal, 28.58% molasses, 5.14% bone meal, 1.72% salt and .25% Vitamin A and D concentrate.

It has been shown to be highly effective in both a wintering type of ration and a silage fattening ration. Other similar prepared mixtures, subsequently developed, including Iowa Supplements 1 and 2 produced by Iowa State College, have likewise proved to be efficient supplements in rations consisting almost entirely of low-grade roughages.

Equally significant results have been obtained in Arizona under completely different circumstances but none the less attributable to the same factors. Feed mixtures containing cottonseed meal, alfalfa meal, and molasses or grain compounded with salt to limit consumption have proved immeasurably successful as range

supplements enabling livestock to make greater use of poor quality forage.

Arizona Tests

A careful analysis of the conditions contributing to the remarkable success attained in balancing the nutritional deficiencies of roughage for beef cattle in the corn belt and elsewhere fail to reveal any great similarity to those encountered by Arizona cattle feeders. Fortunately, Arizona cattle feeders have accessible an excellent selection of well-balanced beef producing feeds — alfalfa, barley and oat hay, hegari silage, cottonseed meal, hulls, barley and hegari grains.

Concentrate feeds, grains in particular, were very sparingly fed if at all in the early years of cattle fattening in Arizona. Cottonseed meal was fed in rather liberal quantities and constituted almost exclusively the only supplement to alfalfa, silage, hulls and other roughage. Numerous tests conducted at this station have shown that rations composed of alfalfa and hegari silage full fed supplemented with 2-4 pounds of cottonseed meal were productive of gains for yearling and two year old steers averaging better than 2¼ pounds per head daily.

The later development of a good market for well finished cattle both locally and on the West Coast led to the introduction of grain feeds into the Arizona cattle fattening rations. Grain and other concentrates are now fed rather sparingly, judged on corn-belt practices, at a rate not to exceed 1 to 1½ lbs. per cwt.

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These yearling steers were fattened on an average ration of 20 lbs. hegari silage, 7 lbs. alfalfa hay, 4.7 lbs. barley, and 2.2 lbs. cottonseed over a 120 day feeding period at a gain of 2.5 lbs. per head daily.



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Instead of feeding several months on a heavy grain ration the fattening process seldom requires longer than 120-150 days. Only by virtue of the superior nutritive qualities of our Arizona feeds, notably alfalfa hay and hegari silage, could this type of ration be so efficiently utilized for maximum beef production.

The current unprecedented prices of livestock feeds in Arizona have created a problem of material importance to the cattle feeding industry. The scarcity of alfalfa hay within suitable price ranges has led to an increased use of cottonseed hulls and grain hay.

Concentrates Studied

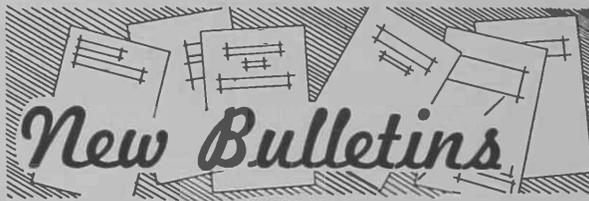
The amount and kind of concentrates necessary to supplement the locally available roughages consistent with expected economic returns, is indicated in the results of a recent test conducted jointly by this station and the Tovrea Land and Cattle Company. One hundred fifty-four yearling steers were divided into four groups and fed fattening rations composed of the same feeds — alfalfa and barley hay, cottonseed hulls, barley and hegari grain, molasses and cottonseed meal, with concentrate to roughage ratios of 1:3; 1:2; 1:1, and 2:1. These four lots were fed for a period of 105 days.

As the proportion of concentrates was increased the daily rate of gain increased, the respective gains for the above concentrate to roughage ratios being 2.4#, 2.5#, 2.6#, and 2.7#. All lots attained a high market finish and were appraised at practically the same selling price. Under current prices, the feed cost per 105 pounds of gain in the order listed above would be \$25.19, \$27.09, \$30.33, and \$30.92.

These results supported by numerous other tests conducted by the Animal Husbandry Department for the past thirty years prove conclusively that the great bulk of cattle feeds produced or readily available in Arizona are well fortified with the essential nutritive elements, and can be efficiently compounded for any desired purpose.

No All-Purpose Feed

There is much variation in the nutrient content of home-grown feeds. Furthermore the objectives of feeding operations are not always the same. The kinds and amounts of the basic feeds and the goal of the feed-



These new bulletins and circulars are available without cost from your local County Agricultural Agent or Home Demonstration Agent.

Extension Service

Folder 63 (Reprint)—Your Key to 4-H Parent Support.

Folder 64 (Reprint)—4-H Lamb Projects.

Circular 129 (Revised) — Raising 4-H Pigs.

Circular 136 (Revised)—Furniture Repair.

Circular 149 (Revised)—In Furniture the Finish Counts!

Circular 195 (Reprint)—Household Pests.

Circular 202 — Storage for Your Home.

Circular 203 — Defoliating Cotton in Arizona.

Circular 204 — Requirements for Arizona 4-H Club Work.

Circular 205 — Water Management.

Circular 206 — An Easy Way to Iron a Shirt.

Circular 207 — Guide Posts in Buying Household Equipment.

Circular 208 — Fertilizer Recommendations for Arizona, 1953.

Livestock Show Jan. 6-10

Don't forget the Arizona National Livestock Show at the State Fair Grounds, Phoenix, January 6-10, 1953.

ing project are factors to consider in providing supplementary feeds. It is quite logical that no one supplemental blend of feeds could meet both the physiological and economic requirements.

Feeders are well aware of the importance of protein, minerals and vitamins but may not appreciate the necessity for supplying ample amounts of energy. Those who expect to produce fat cattle at the choice level with a low-grade roughage and a protein, mineral and vitamin supplement will be disappointed. Such a ration could serve only as a starting or carrying feed.

It is well to know that in the event good quality hay or other roughage is not available, nutritionists are learning how to convert low-quality waste roughages of unusually high potential energy value into usable form for economical beef production.

Plan Storage For Those Toys

(From Page 9)

In the kitchen, a foot and a half of shelf space a foot wide and six inches high would be ample for storing the kitchen utensils with which the children played: a tin cup, a tin can, a pie tin, and wooden spoon.

For families with a large number of different types of toys much more storage space would be required. Two units were planed for the child's bedroom for storing materials used in active play and, in addition, floor space was planned for a wagon, tricycle, doll buggy and two trucks. Wall space was planned for a blackboard and closet space for a "dress-up" costume. One unit was planned for the living room for storing materials for manipulative and quiet play. These are illustrated in the second, third, and fourth pictures on page 8.

These storage units are so simple in construction that anyone handy with a hammer can make them. Working drawings with measurements and a list of necessary materials are given in Technical Bulletin 126, "Indoor Play Areas for the Preschool Child," which is available from the Mailing Bureau, University of Arizona.



DAILY (EXCEPT SUNDAY)

KRUX, Glendale, 6:25 a.m. — Farm Front — Maricopa County Extension Agent.

SUNDAYS

KOY, Phoenix, 8:45 a.m. — Demonstration Garden (County Agent) Program.

MONDAYS

KYMA, Yuma, 7:00 a.m. — On the Farm Front.

KCLS, Flagstaff, 8:45 a.m. — Your County Agent Reports.

MONDAY THROUGH FRIDAY

KYUM, Yuma, 7:20 a.m. — Yuma County Agricultural Extension Service Radio Program.

FRIDAYS

KCKY, Coolidge-Casa Grande, 4:30 p.m. — Pinal County Farm and Home Program.

SATURDAYS

KTUC, Tucson

KSUN, Bisbee

KOY, Phoenix

KYMA, Yuma

KCLS, Flagstaff

Arizona Farm and Ranch Hour, presented by the Radio Bureau, University of Arizona, and the College of Agriculture.

KGLU, Safford, 1:15 p.m. — Stepping Along with the Agricultural Extension Service.