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Survival feeding of cattle during drought

D J. Barker

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SURVIVAL FEEDING OF CATTLE DURING DROUGHT

By D. J. BARKER, Beef Research Officer, Animal Division, and J. T. STOATE, Rural Economics and Marketing Section

TO obtain adequate returns from the grazing of developed land, which has involved considerable capital investment, farmers may carry stock at rates which, though normally satisfactory, are too high in exceptionally poor seasons.

At such times, the two main alternatives are to sell off stock or to supply feed at much higher than normal levels. The decision to sell or retain stock will, in fact, usually be based on the costs of selling and restocking compared to the costs involved in feeding stock. For a number of reasons, feeding can sometimes be the better policy.

Choice of feeds
The type of feed supplied will be governed by (a) availability, (b) price and (c) nutritive value. The most likely available feeds are the various grains—wheat, barley and oats—and the choice lies mainly between them. These have different nutritive values and costs.

The respective costs are currently:
- Wheat—$1.30 per bushel (2.2c per lb.).
- Barley—$1 per bushel (2c per lb.).
- Oats—$0.70 per bushel (1.75c per lb.).

Wheat is a little more nutritious than barley, which in turn is more nutritious than oats, so at the above prices wheat is a relatively bad buy compared to barley or oats, which are about equal to each other in food value for money. Wheat would not be better value for money unless its price came down to about 2c per lb. ($1.20 per bushel).

At present, oats would appear to be the best choice nutritionally and as value for money because it contains a slightly higher proportion of fibre, which will help to insure against digestive disturbances. However, because of its greater bulk, it is slightly more expensive to transport, which could be important over long hauls.

Alternative or additional feeds
During the summer and autumn, some hay and cereal by-products such as straw may also be available. Their feeding value depends upon the species from which they were made, the stage of growth at cutting and the weather conditions to which they were exposed during and after harvesting.

In order of descending nutritive value they will include:
Good quality—
- Good clover hay.
Average quality—
- Poor clover hay; good grassy hay; good oaten or barley hay.
Poor quality—
- Poor grassy, oaten or barley hay; oaten straw; barley straw.
Very poor quality—
- Wheat straw.

If suitable quantities of the good hays are available at a suitable price, they would be preferable to a diet of grains alone and should be used to replace as much grain as possible. However, even poor quality dry roughages and straws are useful in that they are cheap and when fed with grains they help to
insure against the illnesses sometimes encountered when feeding cattle all-grain rations.

These poorer quality roughages may contain an inadequate supply of protein for maintenance, particularly of growing stock, and it may be desirable to supply a small amount of a protein supplement or urea also, particularly if the ration contains a high proportion of this type of roughage.

Urea should not be relied upon too heavily as it is not effectively utilised in the absence of readily available energy. Thus, if no grain is fed and poor quality roughage is used, it would be preferable to feed a little meat meal or other protein meal, than urea. Also in feeding calves up to about six months' old, only about a third of the protein meal should be replaced by the use of urea.

Molasses at W.A. price is a very expensive source of energy compared to cereal grains.

Feeding policy

The quantities of feed supplied will vary with the type of animal being fed. Stock should thus be divided up into their various classes and each class fed separately.

These classes are:
- In-calf heifers 0-6 months pregnant.
- Cows 0-6 months pregnant (dry).
- Cows and heifers 7-9 months pregnant and 1 and 2 months after calving.
- Cows 3-4 months after calving (suckling calves).
- Yearlings 12-15 months old.
- Yearlings 9-12 months old.
- Weaners 6-9 months old.
- Calves 4-6 months old.
- Weaned calves 3-4 months old.

For most efficient utilisation of feed supplied by hand, cows three to four months calved should have their calves weaned, but if the season can be expected to improve in a short time, or it is considered that it is still possible to meet a particularly favourable market without excessive expenditure, it may be preferable to keep the calves on their dams.

Condition

No class of stock should be allowed to fall below "lean-store" condition. On the other hand, stock should not be kept in much better than lean-store condition, because the heavier they are, the greater the amount of feed required to maintain them. Regardless of any recommendations concerning quantities of feed supplied, this should be the aim of survival feeding. Rain, temperature, a bit of bush feed, some short pasture and variations in quality of the grains used, can make noticeable differences to the quantities necessary, so the recommendations made are only a guide, not an absolute rule.

The important point is to maintain the animals in lean but strong condition, so that they will readily recover when the feed position improves.

As a guide for the inexperienced farmer, lean-store condition is when the hip bones and ribs are visible, the back bones and shoulder blades are just visible but are not prominent, the muscles are flat, the eyes are not sunken, and the animal is strong and alert and moves without stumbling when driven.

Calves

Calves are somewhat different, in that they should be kept growing at about 1 to 1½ lb. per day if they are not to be permanently stunted. At this growth rate they should be healthy but in "store" condition.

When to start

Feeding should be started before animals become weak, to avoid the necessity for trying to improve condition on drought rations. If some are much poorer than others, it is best to draft them off and feed them separately, to ensure that they receive their prescribed ration without competition from the stronger ones.

Introducing feed

It is also best to start feeding before all roughage supplies, such as hay, have been exhausted, because the most satisfactory method of introducing grain is by feeding about one third of the quantity to be used finally with about twice that amount of roughage for a few days, and progressively
increasing the grain and decreasing the roughage over the course of a further two weeks.

Particular care should be taken in introducing urea. The animals' intakes should be restricted to $\frac{1}{2}$ oz. per head per day for the first five days, and progressively increased by $\frac{1}{2}$ oz. every four to five days.

If a change of feed is made (such as from one type of grain to another, or from a mainly roughage ration to a mainly grain ration) this should be effected gradually over the course of two or three weeks, by mixing the new feed in progressively increasing proportions.

**Frequency of feeding**

Feeding need not be daily. In fact it may be preferable to feed twice weekly where rations do not exceed $3\frac{1}{2}$ lb. of grain per head per day. A useful rule could be to arrange frequency of feeding so that the amount supplied at any one feed is not greater than 15 lb. per head if feeding is to be every alternate or every third day. Higher levels than this can, of course, be used if feeding is done daily, after a suitably graded introduction of feed.

Feeding should always be carried out daily during the introductory period.

**Feeding methods**

Cattle use grain much more efficiently if it is rolled rather than fed whole. Coarse grinding is also satisfactory, but will be more wasteful if troughing is not available.

Feed should be well spread out to give all animals an adequate opportunity to get at it, especially during the early stages or when animals in varying condition are all fed together. About two to three feet of trough space per cow would be satisfactory.

Troughs can be improvised from materials such as sheet metal, or, on suitably firm ground (such as a roadway or track), the feed can be put out between logs, sleepers, etc. Another cheap form of troughing is 44 gallon oil drums. Cut lengthwise, these give enough trough space for four animals and, at $1$ per drum, only cost 25c per animal for

![Drought feeding in Queensland. The feed is put out between logs on hard ground](image-url)
materials. Troughs should be situated near the water point.

If a mixture of grain and roughage is fed, the roughage should preferably be hammermilled through a $\frac{1}{2}$ in. to 1 in. screen and mixed with grain. If the roughage is not fed like this it should be fed on different days to those on which the grain is fed. Grain and roughages should not be offered simultaneously and separately.

Very thorough mixing of feed is not essential, but the different feed ingredients should be spread evenly along the troughs.

Saline water should be avoided as much as possible because extra salt intake can increase urinary excretion of nitrogen, which is derived from muscle protein breakdown.

**Quantities of feed**

**DAILY RATIONS OF OATS FOR CATTLE**

<table>
<thead>
<tr>
<th>Class of animal</th>
<th>Weight</th>
<th>Daily ration of oats to supply total feed requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-calf heifers 0-6 months pregnant</td>
<td>800 lb.</td>
<td>9 lb.</td>
</tr>
<tr>
<td>Cows (dry) 0-6 months pregnant</td>
<td>950 lb.</td>
<td>8 lb.</td>
</tr>
<tr>
<td>Cows 7-9 months pregnant</td>
<td>950 lb.</td>
<td>11 lb.</td>
</tr>
<tr>
<td>Cows 1st 2 months after calving</td>
<td>850 lb.</td>
<td>11 lb.</td>
</tr>
<tr>
<td>Cows 3-4 months after calving (suckling calves)</td>
<td>850 lb.</td>
<td>20 lb.</td>
</tr>
<tr>
<td>Store cattle</td>
<td>6-700 lb.</td>
<td>7 lb.</td>
</tr>
<tr>
<td>Yearlings (12-15 months age)</td>
<td>5-600 lb.</td>
<td>6$\frac{1}{2}$ lb.</td>
</tr>
<tr>
<td>Yearlings (9-12 months age)</td>
<td>4-500 lb.</td>
<td>5 lb.</td>
</tr>
<tr>
<td>Weaners (6-9 months age)</td>
<td>400 lb.</td>
<td>$4\frac{1}{2}$ lb. + $\frac{1}{2}$ lb. meat meal</td>
</tr>
<tr>
<td>Calves 4-6 months age</td>
<td>3-400 lb.</td>
<td>$3\frac{1}{2}$ lb. oats + $\frac{1}{2}$ lb. meat meal</td>
</tr>
<tr>
<td>Weaned calves 3-4 months age</td>
<td>2-300 lb.</td>
<td>$3$ lb. oats + $\frac{1}{2}$ lb. meat meal</td>
</tr>
</tbody>
</table>

For calves, extra vitamin A and D should be supplied and some roughage should be given at $\frac{1}{2}$ lb. to 1 lb. per day to aid the development of the digestive system.

To convert to other feeds, use the Table of equivalent feed values, which gives the approximate amounts of various feeds equivalent to 10 lb. of oats.

**EQUIVALENT FEED VALUES**

<table>
<thead>
<tr>
<th>Feed</th>
<th>Approximate equivalent to 10 lb. of oats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oats</td>
<td>10 lb.</td>
</tr>
<tr>
<td>Barley</td>
<td>8$\frac{1}{2}$-9 lb.</td>
</tr>
<tr>
<td>Wheat</td>
<td>8$\frac{1}{2}$-9 lb.</td>
</tr>
<tr>
<td>Good clover hay</td>
<td>13-15 lb.</td>
</tr>
<tr>
<td>Average quality roughages</td>
<td>18-20 lb.</td>
</tr>
<tr>
<td>Poor quality roughages</td>
<td>25-30 lb. + 3 oz. urea</td>
</tr>
</tbody>
</table>

For extra protein sources in young animals, each $\frac{1}{2}$ lb. meat meal is approximately equivalent to:

- Sweet lupin meal: $\frac{1}{2}$ lb.
- Linseed meal: $\frac{1}{2}$ lb.
- Urea: $\frac{1}{2}$ oz.

For calves, do not replace more than $\frac{1}{4}$ of the meat meal by its equivalent as urea. For example, if the suggested ration of meat meal is $\frac{1}{2}$ lb. per day, it can be replaced by $\frac{3}{4}$ oz. of meat meal plus $\frac{1}{2}$ oz. of urea.

Meat meal of 50 per cent. crude protein content is less expensive as a source of protein than lupin and linseed meals and contains a better balance of essential amino acids. Fertiliser urea is very cheap but needs care in feeding and will not be so effective as meat meal.
On the above rations, it will be wise to allow access to a free-offer mineral mixture such as below, if the water is fresh:—

25 lb. salt.
25 lb. finely-ground limestone.
50 lb. super.
4 oz. copper sulphate.
1 oz. cobalt sulphate.

Alternatively, this mineral mixture can be mixed with the feed at a rate to supply 4 oz. per head per day for adults, 2 oz. for yearlings or 1 oz. for calves.

If the water is saline the salt should not be included.

Once again it is stressed that the above rations are only a guide and should be adjusted to match the varying circumstances from farm to farm.

Health

Calves should be given vitamins A and D at 20,000 i.u. and 5,000 i.u. per day per head. Older cattle on drought rations should also be given 1 million units of vitamin A every 2 months after the first 4 months on dry feed. If scouring and disturbances of metabolism such as founder (laminitis) occur, increase the roughage and decrease the grain content of the ration and then slowly readjust to the grain ration.

Intestinal worms should be eliminated by treatment if they are suspected to be present in any numbers.

Lice may not be a problem in a summer drought, but should be eliminated if they are apparent.

Other conditions such as pink-eye should be treated promptly on appearance.

COST OF DROUGHT FEEDING CATTLE

The following Tables show the cost of feeding various types of cattle over a nine-month period. All the tables assume that full hand-feeding is used, that is, that no paddock feed is available during this period.

COST OF RECOMMENDED RATION FOR A BREEDING COW*
Mid September 1969 to June 1970

<table>
<thead>
<tr>
<th>Wheat</th>
<th>Price per Bushel</th>
<th>$1.00</th>
<th>$1.10</th>
<th>$1.20</th>
<th>$1.30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost (2,440 lb.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>Price per Bushel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost (2,440 lb.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td>Price per Bushel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost (2,863 lb.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COST OF RECOMMENDED RATION FOR A MATED HEIFER*
To June 1970

<table>
<thead>
<tr>
<th>Wheat</th>
<th>Price per Bushel</th>
<th>$1.00</th>
<th>$1.10</th>
<th>$1.20</th>
<th>$1.30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost (2,530 lb.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>Price per Bushel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost (2,530 lb.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td>Price per Bushel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost (2,968 lb.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Assumed to include 4 months as dry 0-6 months pregnant
+ 4 months as 7-9 months pregnant and 1st 2 months lactation
+ 4 weeks as 3 months calved.
COST OF RECOMMENDED RATION FOR A STORE STEER* OR UNMATED HEIFER
To June 1970

<table>
<thead>
<tr>
<th></th>
<th>Price per Bushel</th>
<th>Cost (1,587 lb.)</th>
<th>Price per Bushel</th>
<th>Cost (1,862 lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>$1.00</td>
<td>$26.44</td>
<td>$1.10</td>
<td>$29.09</td>
</tr>
<tr>
<td>Barley</td>
<td>$.80</td>
<td>$25.39</td>
<td>$.60</td>
<td>$28.57</td>
</tr>
<tr>
<td>Oats</td>
<td>.60</td>
<td>$27.93</td>
<td>.70</td>
<td>$32.59</td>
</tr>
</tbody>
</table>

* Assumed to include 9 months as 15 months to 24 months age.

COST OF FEEDING A CALF*
Mid September-Mid June
(Including meat meal—22½ lb. per head)

<table>
<thead>
<tr>
<th></th>
<th>Price per Bushel</th>
<th>Cost (1,305 lb.)</th>
<th>Price per Bushel</th>
<th>Cost (1,530 lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>$1.00</td>
<td>$22.86</td>
<td>$1.10</td>
<td>$25.04</td>
</tr>
<tr>
<td>Barley</td>
<td>$.80</td>
<td>$22.00</td>
<td>$.60</td>
<td>$24.61</td>
</tr>
<tr>
<td>Oats</td>
<td>.60</td>
<td>$24.07</td>
<td>.70</td>
<td>$27.90</td>
</tr>
</tbody>
</table>

* Includes approximately 3 months at rate for 6-9 months age
+ 3 months at 9-12 months
+ 3 months at 12-15 months.

FEEDING FOR SURVIVAL AND PRODUCTION DURING DROUGHT

FEEDING CATTLE FOR PRODUCTION

In the case of store steers, unmated heifers and calves, a third alternative to selling or feeding for survival exists. This is to feed for survival until some four months before it is anticipated that beef prices will rise to a level high enough to justify the cost of extra hand feeding for production and sale as finished animals.

For example, the animals could be fed for survival until mid-December and then fed a mainly grain ration to prepare them for slaughter in mid-April.

A possible plan of action to achieve this could be as shown in the adjoining Table:

<table>
<thead>
<tr>
<th>Liveweight Sept. 1969 to mid-Dec.—</th>
<th>Store steer or heifer</th>
<th>Calf</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of days</td>
<td>650 lb.</td>
<td>400 lb.</td>
</tr>
<tr>
<td>Daily ration</td>
<td>90 lb.</td>
<td>90 lb.</td>
</tr>
<tr>
<td>Feed supplied to mid-Dec.</td>
<td>630 lb.</td>
<td>405 lb.</td>
</tr>
<tr>
<td>Approx. liveweight mid-Dec.</td>
<td>650 lb.</td>
<td>450 lb.</td>
</tr>
<tr>
<td>(b) Mid-Dec. to mid-April—No. of days</td>
<td>120 lb.</td>
<td>120 lb.</td>
</tr>
<tr>
<td>Daily ration</td>
<td>10 lb.</td>
<td>7½ lb.</td>
</tr>
<tr>
<td>Feed supplied mid-Dec. to mid-April</td>
<td>1,200 lb.</td>
<td>900 lb.</td>
</tr>
<tr>
<td></td>
<td>600 lb.</td>
<td>300 lb.</td>
</tr>
<tr>
<td></td>
<td>1,800 lb.</td>
<td>1,320 lb.</td>
</tr>
</tbody>
</table>

If the steer converts feed at Liveweight gain Dec. to April
Liveweight in April                180 lb.               165 lb.
Dressing percentage                830 lb.               615 lb.
Carcass weight in April             53%                  53%  
440 lb.                             326 lb.
In April, beef prices are usually rising rapidly and it is possible that values of 28c per lb. for lightweight steers in good condition and 31c per lb. for baby beef will be obtained. If this is the case, the values at slaughter of these animals will be:

- Lightweight steer—$123.
- Baby beef—$101.

Assuming the value of oats as—1.75c per lb. (70c per bushel).
And hay as—1.25c per lb. ($28 per long ton).
And meat meal as 5c per lb. ($112 per long ton).

The cost of feeding the steer is $40.
The baby beef is $34.

Thus by feeding for slaughter they may be sold in April for about $83 and $67 respectively, more than the cost of feeding them.

To compare this with the survival feeding strategy, using the same price for oats, the following could apply:

<table>
<thead>
<tr>
<th></th>
<th>Store steer or heifer</th>
<th>Calf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liveweight in Sept. 1969</td>
<td>650 lb.</td>
<td>400 lb.</td>
</tr>
<tr>
<td>Cost of survival feeding to June, 1970 (see table)</td>
<td>$63</td>
<td>$33</td>
</tr>
<tr>
<td>Assumed liveweight in June</td>
<td>700 lb.</td>
<td>550 lb.</td>
</tr>
<tr>
<td>Assumed weight gain June to Nov., 1970</td>
<td>2 lb. per day</td>
<td>2 lb. per day</td>
</tr>
<tr>
<td>Liveweight in Nov.</td>
<td>1,000 lb.</td>
<td>850 lb.</td>
</tr>
<tr>
<td>Dressing %</td>
<td>51%</td>
<td>51%</td>
</tr>
<tr>
<td>Carcass weight in Nov.</td>
<td>510 lb.</td>
<td>433 lb.</td>
</tr>
<tr>
<td>In November, prices are usually falling rapidly and both types of animal might fetch about 22c per lb. at slaughter, showing sale prices of or sale prices minus feed cost — approximately</td>
<td>$112</td>
<td>$95</td>
</tr>
<tr>
<td></td>
<td>$79</td>
<td>$67</td>
</tr>
</tbody>
</table>

If the assumptions made are correct it would thus appear that the farmer would be wise to consider the policy of feeding for slaughter in April, as he may by this means—

- Show at least an equal margin over the cost of feeding.
- Require no pasture over the 1970 season to finish his store cattle and yearlings.
- Have access to income from the sale of these animals some 6 months earlier than he would by survival feeding and finishing on pasture.

As with all planning of drought strategies, a number of assumptions have to be made. It is felt that those above are reasonable and could provide a valid basis of comparison.

The oats in the specimen fattening ration quoted could be replaced by other cereal grains at suitable prices, with equally good or better results. However, the farmer should not attempt to fatten stock on roughages except those of a very high quality. If the roughage is of poor quality it should be kept down to 20 per cent. of the diet or lower, after the introductory period.

High rates of grain feeding should be applied only after a graded introduction, such as by feeding 3 lb. per head per day for a few days and increasing by 3 lb. per head every few days.
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