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The Growth of Cheaper Winter Food for Livestock

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W. O. Watt (1931) *Winter Feeding of a Dairy Herd on a Light-land Essex Farm* ; The Growth Of Cheaper Winter Food For Livestock, pp 34 - 37 - DOI: <https://doi.org/10.23637/ERADOC-1-203>

WINTER FEEDING OF A DAIRY HERD ON A LIGHT-LAND ESSEX FARM

By W. O. WATT

Orsett, Essex

THE farm is situated in the south of the county, on light land with gravel subsoil, and the annual rainfall is 22 inches, of which but a small proportion falls during the growing season. There is a good local market, and London is twenty miles distant by an excellent road.

The farm extends to 288 acres, of which 138 are under grass and 150 under the plough. Of the latter, 30 are in lucerne and the remaining portion of 120 acres is cropped according to the rotation to be described.

One hundred cattle are kept, consisting of forty milk cows with followers. Labour consists of three cowmen, two horsemen, and one tractor driver. Four horses are kept.

Rotation and Cropping

1. *Early Potatoes*.—Variety, "Epicure." Seed is planted at the rate of about 15 cwt. per acre by machine. All potatoes are sprouted in boxes previous to planting. From 3 to 4 tons of Scotch seed are purchased each year and the bulk of the crop is planted from once-grown seed.

Cultivation.—The land is ploughed after harvest, and later cross-ploughed and subsoiled.

Manuring.—10 to 12 tons of farmyard manure is applied in the autumn and 10 cwt. per acre of artificial manure, made up by Messrs Cole & Lequire, of Grays, Essex, to our prescription, which is as follows:—

4½	parts	sulphate of ammonia
10	„	35 per cent. superphosphate
2½	„	steamed bone flour
3	„	sulphate of potash

The cost of this manure, delivered in the autumn of 1928 or the spring of 1929, was £6, 18s. per ton on the farm.

2. *Wheat*.—After the potatoes have been lifted, mustard is sown, and is ploughed in as a green manure in the autumn, the cost of the seed being 10s. per acre. Victor wheat is sown at the rate of 2½ bushels per acre, and the only manure applied is 1 cwt. sulphate of ammonia in February or early March.

3. *Winter Oats*.—Either Grey Winter or Marvellous White Winter is sown in the autumn, at the rate of 2½ bushels per acre

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in the case of Grey Winter, and 4 bushels per acre in the case of White Winter.

Manuring.—4 to 5 cwt. per acre of corn manure, made up to our prescription, is applied in the autumn. This manure consists of:

12 parts	30 per cent. superphosphate
4 „	steamed bone flour
2 „	muriate of potash
2 „	sulphate of ammonia

The cost of this manure, delivered on the farm in the autumn of 1928, was £5, 5s. 6d. per ton. In addition, 1 cwt. per acre of sulphate of ammonia is applied in February or early March.

4. *Barley.*—Plumage Archer 1924 is sown in the autumn, at the rate of 3 bushels per acre; manuring same as in the case of winter oats.

5. *Seeds.*—A seeds mixture, consisting of 16 lb. perennial ryegrass and 8 lb. late-flowering red clover, is sown in the spring, with barley as the nurse crop.

Manuring.—6 cwt. of North African mineral phosphate and 1 cwt. of muriate of potash per acre are applied as soon as possible after the nurse crop has been harvested. The seeds are cut for hay in early June, and a second cut is sometimes taken.

6. *Barley.*—Plumage Archer 1924, autumn-sown. Manure *nil*.

7. *Oat and Tare Mixture.*—Consisting of Grey Winter oats (2 bushels), winter vetches (1 bushel), wheat ($\frac{1}{2}$ bushel). Manure *nil*. This is a cleaning crop, and one cut of hay is taken and then a bastard fallow by tractor during July.

The rotation may be varied to suit certain fields, judged by the quality of the land.

It will be observed that five out of the seven crops are selling crops, except for such portions as may be retained for horse and poultry food and for seed. The average yield of cereals has been: wheat, 6 qrs., oats, 7, barley, 6; and even with low prices these have shown a profit.

It is found to be sound economy to *sell* the cereals and buy concentrates, and it is therefore attempted to produce only the maintenance ration. This is adequately supplied by the lucerne hay, the clover mixture, and the vetch mixture. No meadows are cut for hay. Considering the nature of the soil, relatively high production is maintained and artificials are liberally used.

Under this scheme, which has been in operation for eight years, the land appears to improve in fertility, weeds are kept in subjection, and labour is reduced to a minimum. No roots are grown, as I do not consider them a sound proposition.

Lucerne.—Lucerne leys are occasionally laid down, and there is at present 30 acres under lucerne on the farm. Three cuts are

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taken in the year. Lucerne is sown with barley as a nurse crop and 2 tons per acre of carbonate of lime applied previous to sowing. A dressing of potassic superphosphate is applied after the nurse crop is harvested.

Grassland

Manuring.—6 to 8 cwt. per acre potassic North African mineral phosphate, containing 45 per cent. total phosphates and 6 per cent. potash, is applied in the autumn every three years, part of the grassland being done each year. This manure cost £3, 15s. 9d. per ton delivered on the farm. All the grassland is harrowed with Parmiter harrows in early spring. An experiment is being tried in treating a portion of one of the fields with sulphate of ammonia this year.

Milk Cows

Winter-ration cows receive maintenance ration of approximately 20 lb. hay, consisting of lucerne, clover mixture, or oat and tare mixture.

A production ratio consists of—

1 part	by weight	soya-bean cake
2 parts	„	maize germ meal
1 part	„	maize gluten food
1 part	„	coconut cake

—mixed together and fed $3\frac{1}{4}$ lb. per gallon of milk. This ration is being delivered this year at £10 per ton spot cash.

Dry cows got 20 lb. hay and an average of 6 lb. daily of the above ration. The average yield in 1925–1926 was 800 gallons. The cows are recorded, and culled if not up to a fair average and sold to the butcher.

Calves

These receive whole milk for six to eight weeks, and afterwards receive hay *ad. lib.* and water, and 2 lb. daily of one part linseed cake and two parts crushed oats, increasing the ration as the calves get older.

Poultry

An up-to-date hen-house is provided, housing 200 hens. This is divided into four compartments, each 11 × 12 ft., the total length of the house being 48 ft. The house cost £100 to erect.

Water

Water is laid on to the farm in the cowsheds and poultry-houses. The cost of the water is 1s. 3d. per 1000 gallons, or $3\frac{1}{2}$ d. per ton.

Points worth noting are:

- (1) The high mineral and protein content of the home-produced ration.

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- (2) The simplicity of feeding, permitting of reduction and organization of labour.
- (3) The good effect of these crops on the rotation as a whole in maintaining soil fertility, while obtaining maximum use of atmospheric nitrogen.

Under these conditions the herd has been maintained in a sound and healthy condition, and breeding has been successfully carried on with little trouble from abortion and Johne's diseases.

The herd average in 1927-1928 was 8098 lb. for all cows.

To summarize :

- (1) The question of production of cheap food can be adequately considered only in relation to the economy of the farm *as a whole*.
- (2) It is possible, and in my case profitable, to maintain a herd in good health and production without roots.
- (3) Crops for maintenance should be *high in minerals and protein*, should cost little to produce and handle, and should benefit the cropping rotation. I place lucerne hay first, clover mixture second, and oat and tare hay third in respect of feeding quality.
- (4) It is false economy to feed home produce when such may be sold and equivalent food value bought with a profit on the deal.
- (5) The organization of the details of labour and machinery, with a view to obtaining efficiency and reducing labour costs, is an important aspect of the production of cheap foods.

THE GROWTH OF CHEAPER WINTER FOOD FOR LIVE STOCK

By J. R. KEEBLE

Manningtree, Essex

BEFORE commencing it may be as well to give you a few facts about the holding upon which the matter for my paper has been based. We farm 1000 acres of mixed and light land, two-thirds of which are under the plough. The farm is situated by a tidal river—the Stour. There is a railway siding on the farm and a dock on the river.

We grow 150 acres of sugar-beet as our pivotal crop, about 100 acres of barley, and 30 to 40 acres wheat.

We breed and fat out about 500 hogs a year, mostly baconers, from Large Black sows by a Large White boar. There is a pedigree