Silage — Costs/production O.S

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Economics of Silage Production in the North of Scotland 1967

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SUMMARY

1. The practice of ensilage has been known for more than a century, but only in the last decade has it attained major importance in livestock feeding in the North of Scotland. In Aberdeenshire in particular it now rivals haymaking as the main method of conserving grass. The acreage of grass cut for silage is still increasing.

2. This report presents the results obtained and conclusions drawn from an investigation into the costs and practices of silage-making in the North-East of Scotland in 1967.

3. The sample consisted of 38 farms in the counties of Aberdeen, Banff and Kincardine. The farms varied considerably in type, size, location, quantity of silage made and type of stock fed. The average area of crops and grass per farm was 279 acres and the average quantity of silage made was 425 tons.

4.

Item	Per Acre Per Cut	Per Ton	Per Ton Dry Matter	Per Ton Starch Equivalent
	£ s.	£ s.	£ s.	£ s.
Average Variable Costs	3:16	-:14	3: 4	6:11
Average Total Cost	13: -	2: 8	10:19	22: 8

There were wide variations in the costs incurred on individual farms. The cost of £22: 8: - per ton of starch equivalent can be compared with the cost of starch equivalent from an alternative feedingstuff - e.g. approximately £30: -: - per ton in the case of barley.

5. The average yield per acre per cut was 5.5 tons of made silage, being equivalent to 1.20 tons of silage dry matter or 0.58 tons of silage starch equivalent. This was achieved with an average application of 63 units of nitrogen per acre per cut.

6. The average labour and tractor requirements were 1.0 man hours and 0.8 tractor hours per ton of made silage, 44 per cent of the man hours being spent at the silage pit. An average rate of harvesting of 20 tons of made silage per working day was achieved.

7. Two farmers hired a contractor for the cutting and carting. On the basis of their results it appears that, if regular farm staff can readily

cope with the cutting and carting, it is cheaper to buy harvesting machinery and use the regular staff if more than approximately 150 tons of silage is to be made, but it is cheaper to hire a contractor if less than that is required. The 'break-even' scale of production may be much higher if the regular staff cannot readily cope with the task.

8. It appears that efficient sealing of silage with polythene sheeting may save about 2 in. of surface wastage. This saving alone will more than cover the cost of 500 gauge polythene in one season. There should also be a better fermentation and reduced loss of nutrients in the silage due to excluding the passage of air and the sheets may serve for another season.

9. One farmer made vacuum silage. In this case it seemed to be a successful method of making good silage without the large capital cost of erecting a concrete silage pit.

10. The results showed notable economies of scale arising in silage production. The main economies were achieved in harvesting. The average harvesting cost per ton of silage starch equivalent in the group of farms making over 1,000 tons of silage was less than half that in the group making less than 200 tons of silage.

11. A positive response was found to increasing applications of nitrogenous fertiliser up to the level of 80 units per acre per cut. The average increase in yield of silage starch equivalent was 1.41 cwt. per 10 units of nitrogen applied. Thus an outlay of about 8s. can provide additional starch equivalent which would cost over £2 in the form of purchased barley. Alternatively, on the average farm in this sample an additional 10 units of nitrogen per acre per cut would enable the same quantity of silage to be made with a 12 per cent reduction in the acreage of grass cut.

12. Where the silage was wilted a considerably superior product was obtained on average. This was probably because younger, more nutritious grass could be, and was successfully ensiled when wilted. The total cost per ton was slightly higher for the wilted silage, but the total cost per ton of silage starch equivalent was a little less. The labour requirements were no higher where wilting was carried out.

13. The silage analyses confirmed that farmers making silage for intensive livestock, dairy cattle in particular, tended to cut the grass at a less mature stage to give a more nutritious product. Those with less intensive livestock, such as suckler cows and sheep, tended to cut the grass at a later stage to give a larger bulk of crop. In the latter case the costs per ton of silage and per ton of dry matter were slightly lower but not the cost per ton of silage starch equivalent.

14. Results were also obtained for two farms making high dry matter tower silage. The main difference in the cost of this system arose from the large investment in machinery, amounting to over £2,600. Some saving in labour was achieved compared with conventional silage, and the high average yield of haylage suggests that some reduction in losses was achieved. Nevertheless, the average total cost per ton of starch equivalent for these two farms was £24: 8: - compared with the average of £22: 8: - for the 38 farms making conventional silage. The value of the system depends on the extent to which savings in purchased concentrates can be achieved due to the more concentrated nature of haylage. The great variations found in the dry matter content of haylage in a tower may cause problems in controlling rations so that it is difficult to achieve a large measure of increased production from the haylage.

15. The most striking feature of the results of the survey was the great variation between farms in the values of the various efficiency measures and items of cost. Some of the variation was due to the characteristics of the farms - soil, elevation, slope, local climate, layout of fields and buildings, etc. - which cannot be altered in general. Some of the variation was due to different farming systems or enterprise combinations, which influence the scale of silage production and labour availability and this must be considered when planning the farming system. Some of the variation was due to varying practices with regard to manuring, time of cutting, wilting, sealing, etc. and the analysis of the results has shown the influence of some of these. However, probably the most important factor influencing the costs and efficiency of silage production is the farmer or manager himself. The greatest variations between farms were in

harvesting costs and labour and tractor requirements, which are dependent on the farmer's ability and effort in organising the harvesting and ensiling. The results of this investigation have indicated some of the practices which help to produce good silage at the least cost, but, as with most farm activities, only with careful organisation and attention to details can efficiency be maximised and costs minimised.