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Peas - Cost of production

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Photo by T. W. Gardner

Vining Pea Crop, 1958

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Vining Peas[1]

Traditional dishes, such as the north country pease pudding, are evidence of the long-standing use of peas as human food. The peas used then, however, were fully grown and stored dry in much the same way as a normal grain crop. Moreover, they provided a starchy, filling item of diet. In more recent times, peas have come to be used fresh as a vegetable with main meat courses. Fresh green peas, however, are available for a relatively short period during the summer and it is only with the development of canning and quick freezing that it has been possible to 'capture' the green pea for use at all times of the year.

During the past few years vegetables grown in England and Wales for human consumption have occupied some 450,000 acres and, of this area, roughly 200,000 acres have been used for growing peas. On more than half of this area the peas are harvested dry (over half of these dried peas are ultimately canned as processed peas); the remainder of the crop is shared between canning or freezing and the fresh market - the larger part now being taken by the canners and freezers. Vining peas are, therefore of great importance to vegetable growers.

If the pea crop is important to producers, it is also important, to a lesser degree, to the British canner. The production of canned goods in the United Kingdom is now in the region of one million tons per annum; although consumption is perhaps fifty per cent. greater by reason of large imports, particularly of canned fruit and meat. Half the British output of canned foods consists of vegetables and one quarter of canned peas. It is true that most of these canned peas are still processed dried peas but, with rising standards, it is likely that fresh canned and quick frozen peas will continue to grow in popularity.

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1. The writer of this note is indebted to Mr. W. B. Adam of the Fruit and Vegetable Canning and Quick Freezing Research Station, Chipping Campden, for much of the technical information used. The presentation and interpretation are entirely the responsibility of the writer.

Because the canned or quick frozen pea is intended as nearly as possible to make the fresh garden pea available at all times of the year and also because of increasing competition from alternative vegetables, it has to be a quality product which will satisfy the consumer. Tastes may vary but in descriptive terms a garden pea is expected to be sweet, tender and succulent to eat and of an attractive colour. Fresh peas in such condition are not fully matured: the mature pea is starchy, somewhat tough, rather mealy and loses some of its fresh green colour.

Whilst it is true that appearances may vary and even be a deceptive guide to quality, it is natural that the consumer should prefer an attractive looking article. Attractiveness of appearance involves satisfactory colour, reasonable uniformity of size, and the absence of split peas. In canning it is possible to add green colouring (some colour to counteract the bleaching effect of cooking is necessary) but the frozen pea must be a variety which is naturally of a rich colour. Peas can be separated during processing into relatively uniform sizes and this does not affect growing requirements, although it does mean that very small peas which would sell in pod on the 'fresh' market get discarded in the process. Splits arise from the washing and mechanised handling of the peas and are a loss which is carried by the processor. Wastage of all kinds between the delivered farm crop and the packed pea has been officially estimated at five per cent. by weight of the farm crop. This item will vary with the season and with processors' standards; it certainly seems to have been considerably higher in 1958 at those places in the North-west where information was obtained.

The essential eating qualities of the pea - sweetness, tenderness, and succulence - depend primarily upon harvesting at the right time and subsequently upon expeditious handling. Peas contain a certain amount of sugar and starch (usually 7 to 9 per cent., according to variety and season at the 'garden pea' stage) and it is the sugar

which gives them their sweet flavour. At the right time for vining the ratio of sugar to starch is roughly three or four to one. Once this stage is passed, however, the sugar turns quickly to starch and the essential fresh flavour is lost. At the same time the pea takes on a mealy texture and the skin toughens. Although there may be a small increase in the weight of the crop as this happens, the quality which the consumer seeks is lost. In a normal season any crop is at the right stage for canning or freezing for a period of only a few days. Since frozen peas cannot be 'doctored', the short time during which any crop is suitable for handling is even more critical than with peas for canning.

Various tests have been devised in order to standardise judgment as to the quality of peas. These include the starch-sugar ratio already mentioned, the proportion of alcohol insoluble solids, the tenderometer, the maturometer, and the brine flotation tests. There is a correspondence between these tests although the most reliable is possibly that for the proportion of alcohol insoluble solids; this test, however, takes three hours or more and is too slow for practical use at processing plants. The tenderometer is, no doubt, being more widely used - especially for testing peas for freezing - and provides a quick test of which the results can readily be seen.

When the farmer has harvested and delivered a crop of peas in good order it is essential that the peas should be expeditiously processed if their quality is to be preserved for the consumer. Not more than six hours (preferably less) should elapse between cutting and packing. If peas are to be held longer, they should be stored in water just above freezing point when they will be safe for up to 24 hours (although some sugar may wash out).

Since the peas which are canned and frozen during the summer have to provide the supply for twelve months, there is a considerable concentration of activity within a short time. It is in order to spread

the processing and packing over a somewhat longer period that canners and freezers arrange with farmers to grow early and later varieties of peas and to spread their planting dates according to a plan. Given fairly standard conditions, it is known how much heat is required to carry the main varieties of peas from planting to the harvesting stage. Unfortunately the British climate is too variable for this system of 'accumulated heat units' to enable plantings to be made so that they give a precisely steady flow of harvested crops. Nevertheless, the knowledge is useful in ensuring some degree of spread and orderliness in the ripening of the contracted peas.

The object of all these arrangements and controls is to provide consumers with a product as near to the fresh green pea as possible. As living standards improve and competition plays its part, quality becomes increasingly important.

When farmers grow peas for canners or freezers they may be required by their contract to sow particular varieties or to plant early or late. How do these requirements affect the size of the crop and the return to the farmer? What methods of cultivation help to produce both good quality peas and a high yield? A study of farm grown crops cannot be expected to provide exact and final answers to such questions although it is hoped that our work may throw a little light on some of them.

Since 1958 was such a bad season, it would be unwise to draw any conclusions from these results alone. We hope to present an analysis of two years' results after study of the 1959 crop. Summary tables of the average costs of crops grown for freezing and canning are appended together with some figures indicating the growing importance of the vining pea crop both nationally and in North-west England.

Since vining peas are grown under contract the cost structure is relatively stable from farm to farm. Certain broad differences

observed in 1958 were that acreages grown per farm were larger in Shropshire than in Lancashire (where the farms are mostly smaller); that there was no great difference between costs per acre in the two counties nor between the costs of peas grown for freezing or canning. Yields of peas for canning were about 5 cwts per acre higher than for freezing; in this difference Shropshire (where vining peas are a relatively new crop) was an important influence. Average receipts per cwt. were approximately 2s. 6d. higher for peas for freezing than for canning.

APPENDIX

Table 1. Summary of Average Costs per Acre for Vining Peas, 1958

ITEM	Freezing Peas Average of 50 Farms	Canning Peas Average of 38 Farms	Your Farm
	£	£	£
EXPENDITURE			
Manual Labour	6.2	8.7	
Tractor Labour	3.1	4.2	
Horse Labour	-	-	
Contract	5.4	0.2	
Other Fuel	0.2	-	
Manures applied	4.9	5.1	
Seed	11.1	8.2	
Sundries	0.8	1.2	
Rent	3.5	3.9	
TOTAL	35.2	31.5	
Estimated Costs			
Machinery Depreciation and Repairs	4.7	6.4	
Share of General Farm Expenses	3.4	3.6	
TOTAL	8.1	10.0	
Manurial Residues	+1.2	+1.7	
GROSS COST	44.5	43.2	
Sales	50.2	57.8	
MARGIN	5.7	14.6	
Yield per Acre (cwts)	22.3	27.0	
Acres Costed	884	684	

Table 2. Peas in the Vegetable Acreage

	1949	1951	1953	1955	1957
	000 acs.	000 acs.	000 acs.	000 acs.	000 acs.
England and Wales					
Vegetables in open	513.1	403.5	424.3	438.8	385.2
Total Peas	255.7	180.9	197.4	212.1	161.2
Fresh for market	51.1	40.3	46.5	43.4	30.8
Fresh for canning/freezing	24.4	23.1	32.3	46.9	52.4
Harvested dry	180.2	117.5	118.6	121.8	78.0
	acs	acs	acs	acs	acs
N.W. England					
Vegetables in open	21,875	21,285	23,335	25,046	25,213
Total Peas	4,314	4,581	5,777	7,717	8,307
Fresh for market	1,995	1,716	1,824	1,659	1,270
Fresh for canning/freezing	1,881	2,520	3,770	5,833	6,951
Harvested dry	438	345	183	225	86

Source: Agricultural Statistics

Table 3: Yield per Acre and Production of Fresh Peas for Canning and Freezing

England and Wales		1949	1951	1953	1955
Yield per acre	(tons)	1.2	1.3	1.3	1.7
Production	(000 tons)	31	30	41	81

Source: Agricultural Statistics.

Table 4: Production of Canned Vegetables (000 tons): Can Contents

United Kingdom	1949	1951	1953	1955
All Vegetables	300.8	299.8	332.0	429.6
Processed Peas	139.3	119.8	117.7	155.6
Fresh Peas	25.3	33.5	42.3	64.8

Source: Statistical Review, Fruit and Vegetable Canning Association

Table 5: Production of Quick Frozen Vegetables (tons): Contents

United Kingdom	1951	1953	1955
All Vegetables	6,506	12,800	20,946
Peas	5,282	9,152	15,374

Source: Statistical Review, Fruit and Vegetable Canning Association