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Farm management.

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EXPECTATIONS AND PRODUCTION PLANS
A Study of Managerial Behaviour

BY
J. A. LANGLEY

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FOREWORD

A recent report from the National Economic Development Council, reviewing the conditions favourable for faster growth of the economy, so vital to the future of this country, very rightly lays stress on the role of management as a factor in this process. The report states : " To achieve the increase in productivity necessary for growth will call for highly skilled management throughout the economy not only in industry but in every type of organisation. The term 'management' covers a wide range of responsibility and function, from the boards, lower levels of managers and supervisors of companies, large and small, to the principals of 'one-man' businesses . . . Although a good manager must possess innate qualities of leadership and initiative, which cannot be implanted, these qualities can be developed by the right kind of practical and theoretical training . . .".

The realisation of the importance of the management factor in the national economy has come to the fore comparatively recently, as evidenced by the vast amount of correspondence which has appeared in the past year or two in *The Times* and many other of our national papers and periodicals. This correspondence indicates not only the very great range of opinion concerning the management function *per se*, but also the big question of whether the subject can and should be taught, by whom and to whom it should be taught, and where it should be taught. Perhaps this is not surprising in view of the almost complete lack of knowledge concerning the subject, in this country at least, and the almost complete absence of any volume of research work concerned with this field.

Because of this general paucity of knowledge, in particular the almost complete lack of an established body of theory and principles on which to base the teaching, a common view exists that the development of management courses in Universities, Colleges of Advanced Technology and so on, is fraught with danger. At the same time there is a growing realisation that we do need to know more about the managerial process and entrepreneurial behaviour. In short, we need to develop a body of management theory, more realistic than much of our present traditional theory with which we have surrounded the general field of resource use and the working of the economy in general. Such knowledge will help a better understanding of the decision-making process and narrow still further the uncharted land which exists between uncertainty and decision making.

This study is another, albeit small, attempt by this Department to probe one aspect of this relatively new field under the general title of *The Farmer in Business*.

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Provincial Agricultural Economist.

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I.

INTRODUCTION

The output of milk from South West England in recent years has increased at a relatively much faster rate than the output from many other areas of the country. Although attempts may be made to forecast trends at the regional level, any assessment of the likely future trend in supplies must inevitably be based in the last resort on the response and changes on individual farms. A review of present knowledge would indicate that there is still much to learn about the management process including the response of farmers to price expectations and other stimuli.

This report presents the results of an exploratory study of the expectations, adjustments and future production plans of a group of milk producers in the South West.¹ The study is mainly concerned with how producers see the future, their reasons for making changes and their general behaviour under conditions of uncertainty. It is an empirical study designed to test certain theories of the management process rather than any precise attempt to forecast future milk supplies as such.

The report is divided into three main sections. The first part presents a brief outline of risk and uncertainty in farming and of managerial theory as it is understood at the present time. This section also reviews previous research on the expectations of farmers and how they view the future. The following section analyses in some detail the expectations and attitudes to uncertainty of a group of milk producers in the South West. The third part of the report includes an examination of producers' plans and statistical tests designed to discover any association that may exist between expectations and production plans. Analysis of the basic approach of producers to farm organisation and their stated reasons for making changes is included. The report ends with a summary and conclusions together with some suggestions for future research.

¹The author acknowledges a number of helpful suggestions made by colleagues in the preparation of this report.

II.

UNCERTAINTY, EXPECTATIONS AND MANAGEMENT

The nature of agricultural production is such that plans have to be made and resources committed for a product which will be forthcoming at some future date. Generally speaking, the time lag involved precludes perfect knowledge of the future, so that decision-making must take place in an environment of uncertainty. In other words, time, change and imperfect knowledge mean that the farmer is faced with problems of production and resource use when there is incomplete information about forthcoming events and the future can only be estimated.

Heady (1952) states that the producer is confronted with two types of eventualities or outcomes, namely (a) risk and (b) uncertainty. Risk refers to variability of outcomes which is measurable in an empirical or quantitative manner. For example, the loss of eggs through breakage is a risk for most farm flocks since the number of eggs produced is generally great enough and the frequency of breakage such that most farmers are able to establish the probability of loss within a given time period. Some farmers keep enough cattle so that they are able to establish the probability of losses through death over time. Other things which may be uncertain for the individual farmer can be classed as risk by an insurance company. Since it can be incorporated into the farm costs schedule, risk need not affect decision-making and resource use.

In contrast, the uncertainty situation is present when an outcome cannot be established in an empirical or quantitative sense. Uncertainty is always present when knowledge of the future is less than perfect and Heady states that it is this situation which gives rise to the need for an entirely different framework for decision-making and resource administration (as opposed to the theories of static economics where every entrepreneur and consumer knows what to do under the assumptions made).

Decision-making under conditions of uncertainty is the task and essence of management for with perfect knowledge there would be no need for management. Currently, theories are being evolved to provide a conceptual framework of the managerial process to show how management functions when the future is uncertain. Agricultural economists are contributing to these developments with conceptual material relevant to agriculture. For example, an early model given by Heady (1952) envisages three main steps in the managerial process:—

- (1) The first task is to form expectations of the conditions which will prevail in the future.
- (2) Next, a plan of production and investment must be formulated which is logical and consistent with the expectations held. In practice the plan will take into account not only the expectations formulated but also the surrounding entrepreneurial framework including the individual's psychological make-up, his capital position and the ends to be maximized.
- (3) Finally, the production plan must be put into action.

Johnson *et al* (1961) conclude that management can usefully be envisaged as six steps or functions:—

- (1) Problem definition
- (2) Observation
- (3) Analysis
- (4) Decision
- (5) Action (alternatively execution)
- (6) Responsibility bearing

and state that "Within this uncertain environment, the farmer adopts a managerial behaviour pattern for his farm which allows him to (1) perceive the existence of problems, (2) formulate and reformulate expectations about outcomes as information is gathered, (3) choose the alternative whose expected consequence is most consistent with his wants and preferences and (4) commit resources necessary to put the chosen alternative in operation on his farm and accept the possibility that his expectations and actions may be wrong".

The farmer as manager therefore has to anticipate the future if he is to chart a course for his business. Because the fullest information he may hope to obtain is incomplete and unreliable, business operations always require the formulation of some hypotheses. The objective of the manager in this respect is to gather information about future physical, economic, social and political changes, form anticipations and try to reduce uncertainty to the stage where he feels ready and willing to commit resources and take action. The fact that decisions must be based on expectations about an uncertain future emphasises the subjective nature of the managerial process.

Although expectations represent a subjective view of the future which is peculiar to the mind of the individual, methods of classifying and describing some of the characteristics of expectations have been established in previous research. In addition, empirical studies relating to agriculture have given insights into the expectations held by farmers.

INFORMATION CATEGORIES AND TYPES OF UNCERTAINTY

Some of the first people to work in this field in agricultural economics attempted to determine how farmers see future product prices and yields. The work of Schultz and Brownlee (1942), Brownlee and Gainer (1949), D. B. Williams (1951), W. F. Williams (1953) and Kaldor and Heady (1954) are examples of these early studies. Later research in the U.S.A. has attempted to broaden the scope to include all the possible information categories or types of imperfect knowledge with which farmers have to deal. The Interstate Managerial Survey, a study of the managerial processes on 1,075 farms carried out as a co-operative project by the agricultural experiment stations of seven Mid-Western States (see Johnson *et al* 1961) concluded that the farmer is concerned with four main information categories, namely:—

- (1) Prices
- (2) Production
- (3) Human behaviour
- (4) Institutional arrangements.

The price category includes information on prices received for farm products and also prices paid for inputs used in the production process. Production considerations embrace knowledge of all farm practices,

methods of production and resources used in the production of livestock and crops not forgetting the effects of weather¹. The human category includes information about individuals a farmer has to consider or deal with in making decisions about his farm. Lastly, knowledge of institutional arrangements concerns information on government actions and other national or regional programmes and their effect in farming. It is argued that the farmer must continually gather information about present and future conditions in each of these areas, since knowledge of all four may be required for the making of a single decision.

Raeburn (1959) has dealt at some length with the uncertainties facing the farmer over input-output relations, giving illustrations from British agriculture. He also considered price uncertainties and how far state guarantees have reduced or increased uncertainties affecting farmers' decisions.

NATURE OF EXPECTATIONS

Expectations can be classified and described according to (a) the type of event, (b) their clarity and precision and (c) the degree of certainty with which they are held.

(a) Type of Event

Thornton (1962) suggests that two types of event may be distinguished as :—

- (1) one of a continuing series of which some have already been experienced.
- (2) an event without precedent.

In the first instance the manager has past experience of similar events on which to base his expectations of future outcomes. Expectations of prices of products and inputs and crop and livestock yields in a continuous farming system would generally fall in this category. On the other hand, as the number of preceding similar events declines, the point is approached where little can be learned from experience. Expectations concerning new technology and probably some institutional changes fall more nearly in this latter category.

(b) Clarity and Precision

Expectations may take the form of hazy hunches or refined anticipations with a great degree of precision. For example, one farmer may only be prepared to forecast the general trend in the future price of a particular product (e.g. whether it will be higher or lower than at present) while another farm operator may be prepared to express his anticipations in terms of actual prices. In the latter case the farmer may formulate a single value expectation or a range of prices (multi-value expectation). Again, managers may formulate multi-value expectations either in an ordinal or cardinal sense. Ordinal expectations refer to a ranking of outcomes such as "A is more likely than B, and B is more likely than C and so on". On the other hand, the framing of expectations in a cardinal sense implies that exact (but subjective) numerical probabilities are

¹Heady (1952) distinguishes between technical or yield uncertainty, which refers to variation in the production coefficients of a given technique, and technological uncertainty which refers to the lack of knowledge about new techniques which may be forthcoming in the future.

attached to each likely outcome. Finally, when certain major events are considered possible and a probability distribution of outcomes under each of these events is set out, then expectations take the form of a distribution of distributions.

In discussing price expectations, Heady (1952) says that since knowledge of the future is so imperfect, entrepreneurs normally expect a range of outcomes and after interviewing large numbers of farmers in a study of expectations, concluded that a great many view the future in an ordinal sense. Brownlee and Gainer (1949) in a study of farmers' price expectations concluded with the hypothesis that farmers do not conceive uncertainty in terms of a probability distribution (or probability distributions) of anticipated values. A study by D. B. Williams (1951), however, found some evidence to suggest farmers attach probabilities to each value in a range of possible outcomes. Later studies of price expectations by W. F. Williams (1953) and Heady, Hildreth and Dean (1957) only attempted to ascertain the highest, lowest and most probable prices anticipated by farmers (the range and most probable price).

(c) Degree of Certainty

Expectations are only useful to the individual when he can view them with a degree of subjective certainty which merits planning and action. The characteristics of the expectations, in the form of the parameters of the probability distribution, for dispersion, skewness and kurtosis (peakedness) all reflect the degree of uncertainty involved. For example, many of the early workers quoted seem satisfied that the greater the range of outcomes considered as likely, the greater the degree of uncertainty in the mind of the individual. Also, where there are two distributions over the same range, one with a pronounced peak enclosing most of the readings would signify less uncertainty than a low, flat-topped peak extending over most of the range. However, since many managers are likely to view the future in an ordinal sense, and statistical measures are unlikely to be readily applied to their expectations, it has been suggested that it may be more profitable to think in terms of the degree of belief attached to each outcome. Shackle (1949) has outlined some concepts including a potential surprise function which measures the surprise or lack of surprise which would be felt regarding different outcomes. He argues that there are useful concepts of probability other than those concerned with statistical regularity and also stresses the inapplicability of probability theory for the unique event.

FOUNDATION OF EXPECTATIONS

Research has also been concerned to find out how farmers arrive at the expectations they make and the methods they use to obtain an image of the future. Whilst capacity to formulate images varies with the individual, Johnson *et al* (1961) state that all farmers use some kind of framework(s) to formulate expectations, to guide them in gleaning all the information available and to show them how the information is to be used. These frameworks may be called expectation models and it is relevant to speak of the use of these models whether the prediction of the future is rough or refined, based on pure hunches, ordinal expectations or refined cardinal anticipations.

While the possible methods of farmers are likely to vary from the most rudimentary to refined scientific methods, the early work in this field showed that the past more than anything else serves as a basis for farmers' expectations. Heady (1952) suggested that farmers use simple mechanical models as "rules of thumb" such as forms of average, moving average, random, trend or opposite, modal, outlook or futures models. Later work in the Interstate Managerial Survey, however, indicated that farmers generally were not statistically minded but that product price expectation models were fairly well developed and a variety of models were used such as supply, supply-demand, level of employment and business activity and the general trend in all farm prices. This study also indicated that the majority of farmers do hold expectations regarding prices of inputs, technological change and changes in the institutional environment in agriculture although the models used for the latter expectations were not nearly so well developed. The relatively new field of human expectations was also explored.

EXPECTATIONS AND FARM PLANS

Brownlee and Gainer (1949) emphasised the apparent importance of technological rather than market considerations in accounting for adjustment in farming over time. They found considerable inflexibility in the changing of plans in response to anticipated price changes. Farmers' answers suggested not only inflexibility of plans but also a considerable lack of confidence in the anticipations which were formed. W. F. Williams (1953) concluded that although producers formulate and consider price expectations in making their production plans, they accord them little weight. Empirical results from the Interstate Managerial Survey (Johnson *et al* 1961) showed that in making short term adjustments to their farming, approximately 15% of farmers adjusted or conformed to price, price expectations or price changes. Although these results tend to conform to a general pattern, even the more recent authors take the view that relatively little is known about farmers' anticipations and which aspects of expectations provide a basis for interpreting farmers' decisions. In particular, there appears to be scope for further work on the relationship between expectations and farm plans in the light of recent research on expectations.

OBJECTIVES AND PROCEDURE FOR THIS STUDY

Although theories on expectations have been debated and discussed for many years and a growing body of literature is available concerning expectations held by farmers, recent research workers have taken the view that this field is still largely unexplored. In particular, there is a dearth of empirical studies designed to establish the theories and test the hypotheses that have been put forward. This study therefore is an attempt to make a contribution in this field and to report the results of an investigation into the expectations held by a group of dairy farmers in South West England and the role these expectations play in the managerial process. More specifically the main objectives were to examine:—

- (1) the nature of producers' expectations
- (2) the manner in which they are formulated
- (3) the relationship between expectations and production plans.

Certain hypotheses concerning expectations and uncertainty, based on earlier research, were tested in the light of the considerations in the dairy industry and the experience of a group of farmers concerned with this aspect of agricultural production.

A sample of 40 milk producers was selected from the co-operators in the Farm Management Survey which is undertaken annually by the Department¹. The sample was stratified by type group and herd size in order to include producers in a number of milk producing regions in the South West and a range of herds from small to large. A questionnaire survey was completed by personal interview with the farmers during December 1962 or early in 1963. Information was collected relating to the individual farmer's expectations of price and market conditions for milk and various inputs used in milk production and also expectations held by farmers regarding production methods and institutional changes². Farmers were questioned about current and future adjustments to their dairy enterprise and a record was made of present and proposed herd size, capital investment and also the reasons for making adjustments and changes. A number of questions on general farm policy were also included.³ Background data were available on farmer's age group, years of managerial experience, tenure status and statistics of farm size, herd size, milk output and net farm income in recent years. The data have been cross tabulated and tests of association made between expectations and the degree of uncertainty associated with the expectations of each farmer on the one hand and various characteristics of the farmer, his situation and his production plans on the other hand.

¹These farmers are visited regularly by University staff in connection with the Farm Management Survey and they also assist with other investigations from time to time. In view of their contact with the University over a number of years and their knowledge of the work of the Department, they may represent a premium group for the purposes of a study of this nature.

²The questions on expectations in the questionnaire were adapted from a series of questions developed and used in the Interstate Managerial Survey already referred to. See Johnson *et al* (1961).

³See Appendix for details of the questionnaire.

III. EXPECTATIONS OF MILK PRODUCERS IN SOUTH WEST ENGLAND

In the part of the questionnaire dealing with expectations, three initial questions were put to farmers by way of introduction. In the first instance, and without any reference to such a classification of information categories as that developed in the Interstate Managerial Survey, farmers were asked, "In general, what kinds of things ought a farmer to know about to operate a farm for profit?" The answers to this question were tabulated under the four headings given by the above survey and set out in Table 1.

TABLE 1
NUMBER OF PRODUCERS MENTIONING AT LEAST ONE
COMPONENT OF EACH OF THE FOUR INFORMATION
CATEGORIES.

40 Producers

<i>Information Category</i>	<i>Number of Producers</i>
Production ..	38
Human	22
Prices	18
Institutional ..	2

Producers emphasised production, human, price and institutional considerations in that order. The majority stressed the need for adequate technical knowledge as a pre-requisite to profitable farming and instanced various aspects of livestock husbandry or knowledge of the land and cropping patterns. The replies classed in the human category in this table are the answers from a number of farmers who emphasised the need for certain personal characteristics of the farmer himself such as the level of education, experience or managerial ability. Nearly one half of the producers stated that knowledge of prices was essential but few specifically mentioned the influence of government and other national policies. More revealing perhaps from the managerial point of view was that only 15% of producers mentioned either the need for or importance of knowledge about the future, though a very small percentage came near to giving an accurate assessment of the problems and functions of management as it is understood at the present time. This question was then followed by a very similar question. The farmer was handed a card¹ setting out the four information categories with examples of each and asked, "Here is a list of four kinds of information you have probably used to make decisions about your farming. In the light of your experience, which of these four kinds do you think is the most important in running a farm for profit?" After making a first choice the farmer was asked to rank the three remaining categories in order of importance. The results are set out in Table 2.

¹See Appendix for details.

TABLE 2

**RANKING OF THE FOUR TYPES OF INFORMATION AS TO
IMPORTANCE IN OPERATING A FARM FOR PROFIT.**
40 Producers

<i>Information Category</i>	<i>Most Important</i>	<i>Second Most Important</i>	<i>Third Most Important</i>	<i>Least Important</i>
Number of Producers				
Production ..	22	11	4	3
Prices	6	18	8	8
Human	7	9	11	13
Institutional ..	5	2	17	16

When faced with the four given categories to choose from, farmers tend to place production first and prices in second place. These were followed by human and institutional as about equally important though there was a range in each category with each type of information being classed as most important by some producers. The fact that production is again put first is at least consistent with replies to the preceding question and emphasises that farmers consider that these are matters which are largely under their control and something they can influence. Prices are now given relatively more emphasis. Experience would suggest that many farmers have difficulty in thinking of all the possible answers to the earlier questions on the spur of the moment, but when presented with certain defined categories, they recognise them and are prepared to rank them in order of importance.

Different producers spoke of the importance of different classes of people given as examples under the human category with a noticeable trend for the producer with a family farm set-up to underline the importance of the family members and their effect on the farm business.

Following this, as an introductory question to producers' thoughts on the future, a further question was asked on the four information categories, namely: "Which of these four kinds of information gives you the most difficulty with regard to forecasting possible future changes?" The replies to this question brought a change of sequence in the ranking of the categories as shown in Table 3.

TABLE 3

**RANKING OF THE FOUR TYPES OF INFORMATION AS TO DIFFICULTY
OF FORECASTING POSSIBLE FUTURE CHANGES.**
40 Producers

<i>Information Category</i>	<i>Most Difficult</i>	<i>Second Most Difficult</i>	<i>Third Most Difficult</i>	<i>Least Difficult</i>
Number of Producers				
Institutional ..	33	6	—	1
Prices	6	28	5	1
Production ..	—	2	24	14
Human	1	4	11	24

Most producers were quite definite and adamant about their first and second choice in answer to this question. In putting institutional changes first, they were expressing their concern over the uncertainty attached to government policy and the political considerations affecting agriculture. The majority of producers put this item first and then said that it seemed logical to put prices next since these would largely follow from government policy. They would typically put production changes third and changes in the actions and behaviour of people associated with the farm business as least difficult to forecast. This would suggest that while production information was ranked most important in answer to the two preceding questions producers feel that information about future changes in this category is relatively easier to obtain than information about other things they need to know about.

Summarising from these three introductory questions, it seems that producers consider knowledge about production and prices to be relatively more important than other information needed to operate a farm for profit. But when looking to the future they have the greatest difficulty in forecasting institutional changes and find price changes to be the second most difficult category to forecast. These answers tend to set the scene regarding these information categories and suggest the more important fields for studies of farmers' expectations. The remainder of this section is devoted to describing farmers' expectations concerning future milk prices, input prices, production methods and institutional arrangements¹.

MILK PRICE EXPECTATIONS

Following the introductory probes, a series of questions were asked to ascertain producers' predictions of future milk prices and the foundations for their expectations.

TABLE 4
DEGREE OF RESPONSE TO QUESTIONS ON MILK PRICE
EXPECTATIONS IN TWO AND FIVE YEARS TIME.
40 Producers

Type of Expectation	Two-Year Image Date	Five-Year Image Date
Number of Producers		
(1) No Expectation	2	12
(2) General Expectation		
Higher	6	12
Lower	13	9
About same	19	7
	40	40
(3) Specific Expectations		
Most Probable Price	31	16
Lowest Probable Price	27	14
Highest Probable Price	26	14
Most Probable Price and a Lowest and Highest Probable Price	26	14

¹The relatively new and complex field of expectations concerning people associated with the farm business was not included here since it was considered this subject probably demands a separate study.

Initially all producers were asked, "Do you think the price of milk in two years' time will be higher, lower or about the same as this year?" A following question then asked how the respondent had arrived at his estimate and here an attempt was made to get the producer to talk freely about the method of reasoning used to arrive at his answer. Producers stating an expectation were then asked if they would put their anticipations into financial terms and state three separate expected prices, namely (1) the "most probable price", or the price the farmer considered most likely, (2) the "highest probable price", or the highest price the producer thought there was any chance at all of receiving and (3) the "lowest probable price". Replies to these questions provide three critical points on an individual producer's subjective probability distribution of expected prices¹. The questions were repeated for the five-year image date².

The response to the questions on expectations is given in Table 4, indicating that nearly all the producers interviewed were willing to state some opinion on milk prices in two years' time. However, while some producers stated their expectations with a great degree of conviction, others found difficulty in formulating an expectation of even the most general nature (i.e., about the direction of price movement). Consequently, some felt unable to put their predictions into financial terms, or, if they stated a most probable price, they were unable to quote a probable range around this. After giving producers every opportunity to give their answers (with care being taken not to lead or suggest answers to them) approximately two out of every three felt able to state a highest, lowest and most probable price.

From the evidence it is clear that farmers do make price expectations but impressions during interviews suggest that many had not made specific or precise expectations before the questions were asked. Nevertheless, many gave a general expectation quite readily, indicating that they continually gather information on prices and form some expectations. Some farmers stated that they only formulated specific price expectations at periods when major planning decisions were made—the implications being that, in between times, they only attempted to keep price movements in broad perspective. The way in which expectations were stated would also suggest that the majority of producers view their expectations in an ordinal sense.

¹No attempt was made to find out if producers scale the various prices within a range in terms of mathematical probabilities. A much more detailed line of questioning would be necessary to obtain information on this aspect and it was considered that such detail would not be warranted in the light of the objectives of the study. Indeed, Carter (1950) states that in reality we have no more than a set of entirely subjective assessments of probability, capable of formal measurement on a numerical scale by a single individual, but not of comparison between individuals. The calculation of a mathematical expectation in such circumstances seems a formal and irrelevant exercise. The essence of our knowledge of probabilities is that we can place them in order of "more or less probable" or "more or less surprising."

²The point in time in the future with which the expectation is concerned can be referred to as the image date.

Earlier research has demonstrated how uncertainty increases as more distant image dates are considered. Data for this sample of farmers clearly support this view by showing that a greater proportion of producers felt unable to formulate expectations of milk prices five years hence. Barely one-third were able to quote a most probable price and a range, as against two-thirds for the two-year image date.

Frequency distributions of producers' expectations are given in Table 5 and three of the difficulties involved in the tabulation of this data need to be noted. First, respondents often stated their expectations in terms of differences or changes from present prices, without mentioning what present prices were. This would indicate that what matters more to these producers is whether the price change is 2d. up or 2d. down, for example, rather than the absolute price level. Others asked for details of present prices before attempting to give answers. Second, there was confusion in the minds of some producers about the relationship between seasonal or monthly prices to an overall average figure for the year¹. Third, some producers stated their expectations in the form of the possibility of two or more major events and attempted to indicate a range of probable prices for each event². The details of Table 5 show quite a peaked distribution of most probable prices at the two-year image

TABLE 5
**FREQUENCY DISTRIBUTION OF PROBABLE PRICES EXPECTED
 FOR MILK IN TWO YEARS TIME BY 26 PRODUCERS AND
 IN FIVE YEARS TIME BY 14 PRODUCERS.**

Price per Gallon		Price Expectation at					
		Two-Year Image Date			Five-Year Image Date		
		Most Probable Price	Lowest Probable Price	Highest Probable Price	Most Probable Price	Lowest Probable Price	Highest Probable Price
		Number of Producers					
s	d			1	1		2
3	3						1
3	2						2
3	1				1		2
3	0	1		3	4	2	2
2	11	2	1	4	1	2	2
2	10	1	1	9			
2	9	15	3	7	4	4	3
2	8	4	6	2	1	1	
2	7	2	6			3	
2	6	1	6				1
2	5		2		1		1
2	4				1		
2	3		1			2	

¹In view of these difficulties it was decided to use a basic price of 2/9d. per gallon. This price was used when producers stated their expectations as changes from present price and also given to producers when they asked for such a figure. Such a procedure obviously raises some problems concerning the influencing of farmers' thoughts, but this approach was considered necessary in order to tabulate producers' answers.

²Questioning was not sufficiently detailed to ascertain whether these producers go to the stage of compounding probabilities. They were asked to give their expectations taking everything into account.

date but a much greater dispersion in the lowest and highest probable prices quoted at that date. The table also shows that not only are fewer producers able to formulate expectations as the image date recedes into the future, but the range in the values given by those producers stating expectations increases markedly.

Degree of Uncertainty

A frequency distribution of the ranges between highest and lowest probable prices on individual farms for the two-year expectation is given in the first part of Table 6. No producers stated a single-value expectation (i.e. lowest, highest and most probable prices all the same) though the data indicate a relatively narrow range of only 2d. or 3d. for a high proportion of farms. The size of this range can be taken as one measure of the degree of uncertainty attached to an expectation¹.

In addition to the range or dispersion, other parameters of an individual's subjective probability distribution can reflect the degree of uncertainty involved. For example, skewness indicates the extent to which the various possible expected prices are arranged symmetrically about the mode (most probable price) or are dispersed in an asymmetrical or uneven manner. The second half of Table 6 contains a classification of producers in the form of three broad groups based on this criterion and

TABLE 6
RANGE IN PROBABLE MILK PRICES (LOWEST TO HIGHEST PROBABLE PRICES) ON INDIVIDUAL FARMS AND RELATION OF MOST PROBABLE PRICE TO RANGE.
 26 Producers at the Two-Year Image Date.

<i>Range in Probable Prices (Lowest to Highest)</i>	<i>Number of Producers</i>	<i>Position of Most Probable Price in Range Quoted</i>	<i>Number of Producers</i>
(pence)			
Nil	—	At mid-point	11
One	2	In lower half	6
Two	12	In top half	9
Three	5		
Four	1		
Five	3		
Six	3		

¹Since guaranteed prices for milk are determined by the Government, readers may wonder what scope there exists for price changes and therefore, how much price uncertainty faces milk producers. In this connection it is relevant to state that the Government guarantees are of two kinds. There is an actual guaranteed price determined in February of each year for the year ahead. This guarantee relates to a specific quantity of milk called the Standard Quantity, on which the full guarantee is paid. Supplies in excess realise a lower price approximating to the returns for milk used in manufacture and an extra 100 million gallons may reduce the pool price by about 1d. per gallon. Secondly, there is a guarantee that the price of milk may not be reduced by more than four per cent. in any one year or not more than nine per cent. over three years. This limits the reduction that can be made in the guaranteed price in any one year to about 1½d. per gallon. Therefore, the combined effect of an increase in supplies outside the standard quantity and the full permissible reduction in guarantees could conceivably amount to a reduction of 2d. to 3d. a gallon in any one year and possibly double this in a two-year period. The range in possible prices from these substantial reductions on the one hand to increases on the other hand indicates the theoretical scope for price variation.

the high proportion of asymmetrical distributions would suggest that farmers were not formulating their expectations in a purely mechanical way. Without a knowledge of the relative weighting of the probability of different outcomes in the range quoted by any individual, it is unsafe to draw too many conclusions about the asymmetrical distributions. But it might be inferred that those producers with the most probable price in the higher prices of the range quoted evidently considered that there was more scope for price reduction than increases in relation to the most probable price they stated. In view of the trend towards lower prices in recent years and the proportion of producers anticipating lower prices two years hence, this situation is understandable. On the other hand, the relatively large number of producers with most probable prices in the bottom half of a range may look somewhat surprising. It may well be that these producers see a limit to the likely fall in prices, by way of guarantees or for some other reason, and yet consider there are possibilities of substantial increases in price.

A more inclusive rating of uncertainty would be one based on the range in relation to the most probable price quoted, where the higher the rating, the greater the degree of uncertainty associated with the expectation¹. Such a rating has been used as a measure of uncertainty for the classification of the 26 producers in Table 7. Using this classification, the whole sample of 40 producers has then been divided into three broad groups in Table 8 according to the degree of uncertainty attached to stated expectations. The 14 producers not included in Table 7 were firstly allocated to Group 1. It will be recalled that these producers either

TABLE 7
**DEGREE OF UNCERTAINTY IN MILK PRICE EXPECTATIONS
 AT THE TWO-YEAR IMAGE DATE.**
 26 Producers.

<i>Uncertainty Rating*</i>	<i>Number of Producers</i>
Nil	—
0·1 and under 5·0 ...	4
5·0 and under 7·5 ...	10
7·5 and under 10·0 ...	5
10·0 and under 15·0 ...	3
15·0 and over	4

* Range (lowest to highest probable price) x 100 divided by the most probable price.

gave no expectation whatsoever or were only partly able to form expectations and therefore have been classed as most uncertain. Then the 26 producers in Table 7 were divided into two groups according to their uncertainty rating to provide an average and a least uncertain group.

¹Range x 100 divided by the most probable price. See Heady, Hildreth and Dean (1957).

TABLE 8

**CLASSIFICATION OF PRODUCERS ACCORDING TO DEGREE
OF UNCERTAINTY ATTACHED TO EXPECTATION OF
MILK PRICES AT THE TWO-YEAR IMAGE DATE.
40 Producers.**

<i>Uncertainty Group</i>	<i>Number of Producers</i>
Group I (Most Uncertain)	
No Expectations	2
General Expectations with :-	
No Prices stated	7
Some Prices stated	5
	<hr style="width: 50px; margin: 0 auto;"/>
Group II (Average)	14
Most Probable Price and a Range with Uncertainty Rating greater than 7.5	12
Group III (Least Uncertain)	
Most Probable Price and a Range with Uncertainty Rating less than 7.5	14
	<hr style="width: 50px; margin: 0 auto;"/>
	40

Tests of Association

Using these three broad uncertainty groups an attempt was made to determine whether or not the degree of uncertainty attached to price expectations is related to certain social and economic characteristics of the farmer and his business. For this purpose, simple two-way classification tables were constructed to show the distribution of producers in each uncertainty group when classified according to one of the chosen criteria. An example is given in Table 9, where the 40 producers are classified by the degree of uncertainty attached to their expectation of milk prices on the one hand, and net farm income on the other hand.

TABLE 9

**CLASSIFICATION OF PRODUCERS ACCORDING TO NET FARM
INCOME AND THE DEGREE OF UNCERTAINTY ATTACHED TO
PRICE EXPECTATIONS FOR MILK.
40 Producers.**

<i>Net Farm Income (per farm)</i>	<i>Uncertainty Group</i>		
	<i>Most Uncertain</i>	<i>Average</i>	<i>Least Uncertain</i>
	Number of Producers		
Under £1,225	8	6	6
£1,225 and over	6	6	8

From the number of producers falling in each cell of the table it can be ascertained whether or not there is any significant association between the variables by the application of the chi-square statistical test. The results of these tests are shown in Table 10.

TABLE 10

**RESULTS OF TEST OF ASSOCIATION BETWEEN THE DEGREE OF
UNCERTAINTY ATTACHED TO PRODUCERS' MILK PRICE
EXPECTATIONS AND CERTAIN OTHER CHARACTERISTICS
OF THE FARMER AND HIS BUSINESS.**

40 Producers.

<i>Factors tested for association with degree of uncertainty attached to milk price expectations</i>	<i>Value of χ^2</i>	<i>Appropriate Value of P (a)</i>
Age of farmer	1.52	.50
Managerial experience of farmer (years) ..	2.09	.40
Size of herd	1.06	.60
Type of farm (b)	0.21	.80
Net farm income (per farm) (c)	0.62	.70

- (a) Denoting the level of probability that a value of χ^2 at least as large as that calculated would arise by chance.
- (b) Farm businesses were grouped according to their emphasis on dairying—i.e. milk output as a per cent. of total farm output.
- (c) Average for the two years 1960/61 and 1961/62.

No significant relationship¹ was found between the degree of uncertainty and either age of farmer, managerial experience of farmer, size of herd, type of farm, or net farm income. It might be thought that older farmers or those with more experience would feel able to judge likely future prices with more precision than younger operators, but it may well be that the more experienced men have also learned how difficult it is to forecast future changes in farm prices and consequently feel as uncertain as other producers. The evidence suggests that milk-producers with larger herds or with specialist type dairy farms also feel unable to formulate price expectations with any greater certainty. It might be expected that producers on farms where dairying accounts for a high proportion of total farm output would be more concerned about future prices and possibly state expectations with a greater degree of certainty, but this does not appear to be so. Neither do farmers with higher profits appear to formulate expectations with less uncertainty. Of course, it must be remembered that those producers who state expectations with the least uncertainty are not necessarily those who make the most accurate forecasts.

A number of other factors may well be associated with the degree of uncertainty. For example, level of education, attendance at farmers' meetings, participation in outside activities and reading habits are possible factors associated with formulation of expectations. Future research in this field will need to pursue these and other avenues in more detail.

¹At the 5% level of probability.

Expectations of the Relative Prices for Milk and Other Farm Products

Finally, respondents were asked if they envisaged any significant changes in the relative prices of milk and other farm products. The answers to this question, summarized in Table 11, indicate two main conclusions. Firstly, nearly all producers hold expectations of this nature but they appear to be formed in a very general way. Secondly, the majority envisage no changes in the relative prices of milk and other farm products in the longer run. Many suggest that relative prices may vary in the short term but will return to an equilibrium position near the present level. In other words, it was considered that milk will maintain

TABLE 11

PRICE EXPECTATIONS FOR MILK RELATIVE TO OTHER FARM PRODUCTS. 40 Producers.

<i>Expectation</i>	<i>Number of Producers</i>
Milk prices relative to other product prices generally will :-	
Stay about the same	28
Improve	6
Decline	4
Don't know	2

its relative position. The implications of this conclusion in relation to farm plans will be examined in the next section.

Foundations of Milk Price Expectations

Various systems of reasoning are used by farmers in trying to secure information about the future and these systems of reasoning or frameworks are called expectation models. Johnson *et al* (1961) state that all farmers use some kind of framework to formulate expectations, to guide them in gleaning all the information available and to show them how the information is to be used. An expectation model can therefore be looked upon as giving (1) a mental picture of how the expectation is to be formulated and (2) the nature and magnitude of the information. Thus, it is relevant to speak of the use of expectation models whether the prediction of events in the future is rough or refined, based on pure hunches, ordinal expectations or precise cardinal anticipations.

A distribution of the expectation models used by the producers interviewed in this study is given in Table 12. At the two-year image date twelve different models were discernible. The four most widely

TABLE 12

**EXPECTATION MODELS FOR FORMULATING
MILK PRICES.***

<i>Model</i>	<i>Two-Year Image Date</i>	<i>Five-Year Image Date</i>
	Number of Producers using each Model	
Government action	24	15
Supply	19	1
Cost of production	12	7
Lag or extension of recent or current events	9	4
Demand	6	5
Supply and demand	6	4
Quality	3	—
Political	4	1
Business activity and economic prosperity	3	1
General trend in farm prices	1	2
Inflation	1	11
Trend	1	1
Cost of living	—	3
Similar product analogy	—	1
Cyclical	—	1
Foreign trade	—	1
Total Number of Models	89	58
Number of Producers	40	35

* The description of models used here is based on a classification of models evolved for the Interstate Managerial Survey. See Johnson *et al* 1961.

used models were (a) government action, (b) supply, (c) cost of production and (d) lag or extension of recent or current events. This evidence suggests that:—

- (1) Producers have a strong conviction regarding the influence of government on future conditions in the dairy industry.
- (2) Producers are aware of the concepts of supply and demand but use the concept of supply to a much greater extent than demand or a model incorporating both supply and demand. This is a feature which has been demonstrated by earlier research and it has been suggested that producers may have more information on supply than demand, or they are not so familiar with the concept of demand and its effects, or they assume that demand is stable and therefore most price changes are the result of changes in supply conditions.
- (3) The cost of production model used by several producers may be a reflection of the methods of, and attitudes toward, government support for farming in recent years.
- (4) A model incorporating a lag or extension of recent or current events is regarded by some producers as the most appro-

appropriate method of forecasting changes in the near future. The tendency to project recent prices into the future, with some modification, was noted on Page 18.

Previous research has shown that sometimes a farmer uses several models in combination. At the two-year image date in this study the 40 producers used a total of 89 models. Whilst every producer used a minimum of one model, many used three and some used as many as four models. However, the question of how two or more models were combined to make a single expectation was not investigated. In addition, it is well to appreciate the fact that two operators may use the same model but while one may have limited information to analyse and fail to reach the stage of forming an expectation, the other operator may have sufficient empirical and factual information to arrive at a refined expectation. Despite this problem, and also the small size of the sample, an attempt was made to determine if there was any significant relationship between the number and type of expectation models used on the one hand and the degree of uncertainty attached to the resulting expectations on the other hand. Conclusions from this analysis were that producers stating expectations with less uncertainty (a) used rather fewer models to make their expectations (b) used less government actions models but more demand and cost of production models. It appears that when producers use government action or political models to predict future prices, then their expectations are associated with a greater degree of uncertainty.

Finally, the effect of time or length of run on producers product price expectations can be considered although comment has already been made on the degree of response to questions at the two and five-year image dates (see Table 12). Previous work has emphasised that the range of an individual's probability distribution decreases as time passes and the image date comes closer, because more information is generally available. There is some evidence in this study to support this for the average range between highest and lowest probable prices for a group of producers at the five-year date was 2.9 pence, but the corresponding range for the same producers at the two-year date was 2.5 pence. It has been suggested, however, that more may be involved than a mere increase in the amount of information. Increased information may allow the farmer to use more mature models, enabling him to predict future prices with a greater degree of certainty. The data in Table 12 show clearly that not only were less models used at the five-year image date, but some different models were included¹. For example, proportionately fewer supply models, or lag or extension of recent or current events models were used. At this more distant date, inflation, cost of living and demand models were relatively more important.

Some probing questions were then put to producers concerning their expectations of (a) future prices and market conditions for inputs (b) future production methods and (c) future changes in the political and institutional environment. Although previous research would clearly indicate that these are fields for extensive enquiry in their own right,

¹In giving details of their methods of reasoning for the five-year image date, having already answered a similar question for the two-year image date, there is the possibility that producers would not take the trouble to describe again the models they have already given, even though they used them at the five-year date too. They may have simply added to their earlier answers.

exhaustive questioning was not attempted. For the purpose of this study, a limited number of questions was asked to determine broadly whether producers formulate expectations in these fields, the type of models they use and whether their expectations at the time of the interview were directly influencing their farm plans and adjustments.

PRICE EXPECTATIONS FOR INPUTS

Milk producers buy many things to operate their farms; feed, labour, fertilisers, seeds and machinery are some examples. Farmers were asked which item concerned them most from the point of view of probable cost in the future. Questions were then put to producers to ascertain under what conditions they assumed that the price for the input they were most concerned about would firstly be higher and secondly be lower than at the time of the interview. The answers were then classified according to the general models used and these are set out in Table 13.

TABLE 13

EXPECTATION MODELS FOR FORMULATING PRICES OF INPUTS. 40 Producers.

Model	Inputs*		
	Feed	Other	Total
	Number of Producers		
Government action	20	6	26
Cost of production	7	1	8
Supply	6	1	7
Trend	2	5	7
Supply-demand	4	2	6
Business activity and economic prosperity	—	6	6
Manufacturer's power and policy ..	3	3	6
General or unspecified labour cost	2	2	4
Demand	2	1	3
Foreign trade	2	—	2
Cost of living	—	2	2
Political	—	1	1
Inflation	—	1	1
Similar product analogy	1	—	1
War	1	—	1
International situation	1	—	1

* 24 producers specified feed, 10 labour, 5 fertilisers and 1 machinery services as the inputs they were most concerned about.

The models most frequently used appear to be (a) government action (b) cost of production (c) supply (d) supply and demand and (e) trend although a large number of other models were also used. There is some similarity between the type of model used for predicting future prices and market conditions for inputs and those used for predicting price for a product (milk in Table 12). However, this may be more a reflection of the type of inputs considered by most producers, for no fewer than 24 out of 40 producers were most concerned with future prices for feed. For farm produced inputs like feed, as opposed to other inputs of an industrial origin for example, the models used for predicting the price of the commodity when considered as an input would be expected to bear some relation to the models used for predicting price when the

commodity was an output. This would go some way in explaining the preponderance of government action models and perhaps the relative absence of the effect of demand. Models for inputs, therefore, are likely to vary according to the type of input considered. No specific expectations were called for but it is clear from the answers given by respondents that farmers do formulate expectations in this field. The extent to which their anticipations affect farm plans will be discussed in later pages.

EXPECTATIONS REGARDING NEW TECHNOLOGY

Technological change leads to variation in production methods and problems of choice for managers. Uncertainty is present since investment decisions must consider whether the techniques and resource use to be adopted will be as efficient as a new technique which may come on the market in the near future. Indeed, it is argued that new technology is one of the most dynamic forces with which managers have to deal in present day farming. How farmers view this problem, attempt to predict the future and plan in such an environment of uncertainty is a subject in which relatively little research has been undertaken. Questions were put to the 40 milk producers interviewed in this study to find out if they make anticipations of new technology in farming, how their expectations are formed and how these expectations affect their farming plans. More specifically producers were asked "Do you think there will be changes in farming methods and techniques in dairying during the next two years?" The answers showed without exception that the farmers interviewed held expectations regarding new technology, although about one in three held expectations calling for no change.

It appears that two main models are used for predicting the future. The most widely used was a trend or modified trend model. Farmers using this model generally placed emphasis on such considerations as things always change, a belief in progress, a continuation of the present period of change, or point to the fact that newer methods are always being recommended. Secondly, a production needs model was frequently used. Many producers take the view that new technology will be developed to solve the problems and meet the needs that are already known and felt, while others would argue that present production methods are adequate. Finally, a few producers suggested that two years was too short a period for change (indicating a time model) and the view was also expressed that an upper limit in progress had now been reached. Those expecting change were also prepared to give examples of the new technology they considered may well be developed¹. Clearly, producers hold expectations regarding new technology in dairy farming.

EXPECTATIONS ABOUT THE INSTITUTIONAL ENVIRONMENT

The institutional environment in which farmers operate is subject to continual change. Some of the more important changes here, of course, are associated with government price and production policies and methods of supporting agriculture, although institutions like marketing

¹Amongst other things producers mentioned labour-saving methods of handling milk, progress towards automatic milking techniques, new types of buildings, new foods and progress towards new mechanised low-cost systems of dairying.

boards also make changes which have their impact on the farm business. Farmers need to be continually gathering information on these matters therefore and attempting to anticipate future changes. As with the other types of uncertainty considered, introductory questions were designed to ascertain whether or not producers formulate expectations in this field, how any such expectations are formed, and how these anticipations affect farm plans and the exercise of the management function.

All producers were asked, "Do you think there will be changes in government policy or other national schemes for dairy farmers during the next two years?" Twenty-three producers stated they expected changes, eight held expectations indicating no change, six thought change and no change just as likely and three producers stated they did not know. From these proportions it might be argued that the majority of producers do formulate expectations in this field, but once again the extent to which they thought about these matters before the question was asked is not known.

A classification of producers' answers according to the method of reasoning or general model used shows that producers relied most frequently on three models. The most commonly used was the problem-solving model in which the government or other institution concerned is envisaged in the role of problem-solver. Such a model allows expectation of change because it is felt that there are problems to solve, or it is considered that there will be problems in the time period stated. There is also an expectation of no change because there are considered to be no problems. Second, many producers used a general political model, which included reasoning about negotiations between national governments with a view to economic or political association. The third most widely used was a party-political model. In this connection a forthcoming general election influenced some producers who either thought that programmes would vary before an election took place or associated a new government with new policies and legislation for agriculture.

The awareness of producers of the impact of government actions on farming is underlined by these models and needs little emphasis. The position is also reflected in the high proportion of government action models for formulating price expectations. The maturity of the models and the degree of confidence associated with expectations was not investigated, but impressions gained during the interviews suggest that the majority of producers were only able to state their expectations in general terms. In other words, despite recognising the overwhelming importance of government in farming, the majority are unable to state their expectations in any precise way. If this is so then the implication is that while these changes are vital to the individual farmer, lack of precise knowledge about future changes in this field means that these expectations may only have a limited effect on farm plans.

IV.

EXPECTATIONS AND PRODUCTION PLANS

Heady (1952) states that once management has completed the first of its functions (formulation of expectations) it is ready to plan a course of action or pattern of production consistent with the expectations held. But plans are not complete until the manager has obtained sufficient information and reduced subjective uncertainty to a point where he is ready, willing and able to act and accept the consequences of his actions. In other words, the necessity for making subjective forecasts places a limit on the distance into the future for which producers can plan in a meaningful manner. This limit to which individuals plan economic activity is generally termed the economic horizon.

How far ahead do farmers plan? In addition to the length of time for which individuals can formulate useful expectations, the time span is influenced by a number of other factors such as the durability of any investment made, the fixity of assets (represented by the difference between purchase price and realization price) and anticipated rate of use. In addition, of course, there are human factors such as age of farmer and the intentions of other family members. Questions put to producers on this topic revealed a variety of views. At the one extreme, some maintained that it is both possible and necessary to make long term plans, even to retirement age, while others were quite definite that it was impossible to make plans in farming for anything but the short period. This situation apparently results in many cases from differences in what is meant by plans and planning. Those producers who attempt long term planning probably do so only in broad terms with general objectives in mind. The majority was in fact agreed that detailed plans in farming could only be made for a relatively short period ahead. In other words, they typically make detailed plans in the short period only, they have outlines of plans for the medium length of run perhaps and some have broad long term objectives. The aims of this section of the report are to ascertain in greater detail the extent to which producers feel able to state their future production plans and then to see if any association exists between these plans and stated expectations.

In the first instance, producers were asked for anticipations of their future herd size in one, two and five years' time. Secondly, all those interviewed were asked for their considered opinion on the likely trend of milk yield per cow for their herd and to make quantitative forecasts of the changes they expected to take place. A combination of these two sets of data enabled the probable future milk output for each farm to be calculated for the one, two and five-year image dates. The degree of response to these questions is shown in Table 14, indicating that practically all producers felt able to answer these questions for one and two years ahead. At the five-year image date the degree of response fell appreciably, resulting in a similar response to that experienced for product-price expectations.

In Table 15, the average percentage change in cow numbers, milk yield per cow and milk output is given for those producers stating ex-

TABLE 14

**NUMBER OF PRODUCERS WILLING TO STATE EXPECTATIONS
OF (A) FUTURE HERD SIZE AND (B) FUTURE HERD SIZE
AND FUTURE MILK YIELD PER COW.**

<i>Image Date</i>	<i>Herd Size</i>	<i>Herd Size and Milk Yield per Cow</i>
	Number of Producers Stating Expectations	
One year	40	40
Two years	38	37
Five years	25	24

pectations. It might be wondered whether producers would merely state the herd size and milk output they hope for rather than give expectations based on their plans and considered opinions of what will probably be achieved in practice. However, there seems remarkable similarity between the anticipated changes for two years ahead and the actual

TABLE 15

**PER CENT CHANGES IN EXPECTED HERD SIZE
MILK YIELD PER COW AND RESULTING
MILK OUTPUT FOR THE GROUP.***

<i>Image Date</i>	<i>Herd Size</i>	<i>Milk Yield per Cow</i>	<i>Milk Output</i>
	Per cent. change for the Group		
One year	+ 5.4	+ 1.2	+ 6.6
Two years	+10.7	+ 3.0	+14.0
Five years	+17.5	+ 5.9	+24.0
Actual increase over two preceding years	+10.0	+ 1.9	+12.1

*Those stating expectations at each date.

changes that took place over the two preceding years. This would suggest that producers were making their expectations in the light of previous experience.

Information was collected on the capital invested in dairying during the recent past and producers were also questioned as to the plans they had for investment in the foreseeable future (the next two years approximately). This investment would relate to expenditure on any buildings, equipment, machinery, improvements or other items associated with

milk production but excludes investment in livestock¹. Finally some general policy questions were put to producers concerning (a) their attitude towards the flexibility principle and (b) current and future changes leading to diversification or specialisation in the farming system.

MILK PRICE EXPECTATIONS AND PRODUCTION PLANS

All producers were then classified and grouped according to these varied criteria and simple two way classification tables were prepared on the basis of producers' production plans on the one hand and the level of expected prices or the degree of uncertainty attached to price expectations for milk on the other hand. The chi-square test of association was then applied to the data in each table in order to ascertain if any relationship or association could be found between expectations and production plans. The results of these tests are set out in Table 16. In this table the level of expected prices simply represents a broad grouping of producers according to their price optimism at each date, while the degree of price uncertainty refers to the uncertainty rating developed in the previous section (see Page 21).

At the two-year image date no association could be established between the level of expected milk prices and intended changes in cow numbers or milk output in one or two years' time. This is an important conclusion regarding the possible influence of future prices on the level of output in the short run and indicates that if an association exists then it is not a simple and straightforward one. However, the data do show a relationship between the level of intended capital investment and the degree of price optimism. This would seem a reasonable association though it may be wondered whether those producers who forecast higher prices feel able to make relatively greater investments, or whether those producers who anticipate lower prices may feel the need for additional investment to produce at lower costs or more of the product. The tests of association do not distinguish the causal factors in any relationship but an inspection of the data shows that the former is more likely to be the case.

Similarly, when producers were classified according to the level of milk prices expected in five years' time, no association was established between the level of price expectations and either cow numbers or milk output in one or two years' time. In other words, neither long-term price nor short-term price anticipations appear to have a clear influence on the level of milk output. With five-year price expectations there is also an association between the level of prices expected and capital investment, but in this case the relationship is between price and recent past plus intended capital investment. It would appear therefore that short-term price expectations affect short run investment decisions whilst an association exists between long-term price expectations and the level of capital investment over a longer period (recent past plus intended investment gives a longer-term measure of the level of investment and more time for each producer to reach an equilibrium position).

¹Where landlords made investments for tenants who then paid an annual charge, the total capital cost was included in order to treat all farms on a more comparable basis.

TABLE 16

**RESULTS OF TESTS OF ASSOCIATION BETWEEN PRICE
EXPECTATIONS FOR MILK AND PRODUCTION PLANS.**

<i>Factors Tested for Association</i>	<i>Value of χ^2</i>	<i>Appropriate Value of P (a)</i>
<i>Level of Expected Milk Prices at the Two-Year Image Date and :-</i>		
Cow numbers in 1 year's time (b)	0.116	0.90
Cow numbers in 2 years' time	0.847	0.40
Milk output in 1 year's time (c)	0.675	0.40
Milk output in 2 years' time	0.731	0.40
Intended capital investment (d)	5.202	0.02*
Recent past plus intended capital investment (e)	1.769	0.20
<i>Level of Expected Milk Prices at the Five-Year Image Date and :-</i>		
Cow numbers in 1 year's time	2.332	0.10
Cow numbers in 2 years' time	0.301	0.60
Milk output in 1 year's time	1.501	0.20
Milk output in 2 years' time	0.106	0.80
Intended capital investment	0.054	0.80
Recent past plus intended capital investment	5.250	0.02*
<i>Degree of Uncertainty Attached to Price Expectations at the Two-Year Image Date and :-</i>		
<i>Producers' ability to state plans (in five years' time)</i>		
.. ..	4.484	0.10
Cow numbers in 1 year's time	0.572	0.80
Cow numbers in 2 years' time	2.524	0.30
Cow numbers in 5 years' time	0.410	0.80
Milk output in 1 year's time	0.256	0.90
Milk output in 2 years' time	0.763	0.70
Milk output in 5 years' time	0.166	0.90
Intended capital investment	2.323	0.30
Recent past plus intended capital investment	1.192	0.50
Attitude towards flexibility (f)	2.483	0.30
Adjustments for diversification (g)	1.386	0.20

*Significant at the 5% level of probability.

- (a) Denoting the level of probability that a value of χ^2 at least as large as that calculated would arise by chance.
- (b) Refers to the number of cows and heifers in milk and dry.
- (c) Calculated from expectation of cow numbers and anticipated future trend in yield per cow.
- (d) Capital investment in dairying, including buildings, equipment and machinery, etc., but excluding livestock and any land purchased. Where a landlord put up a new building, for example, on behalf of a tenant, the capital cost was included.
- (e) This figure refers to capital investment in recent past (previous 12 months or thereabouts). Both recent past and intended investment have been related to herd size.

Tests involving plans at the five-year image date were not always possible because of the smallness of the sample. The number of degrees of freedom varies in the tests, and hence the relationship between the values of χ^2 and P, because of variation in the number of cells in the tables.

On the other hand, on theoretical grounds it would seem highly probable that the degree of uncertainty attached to expectations would be reflected in production plans, since the manager needs to reduce un-

certainty to the stage where he feels sufficiently convinced about future outcomes before plans can be completed. An attempt was therefore made to establish association between the degree of uncertainty attached to milk price expectations (at the two-year image date) and producers' ability to state their production plans. Since practically all producers gave their plans at the two-year image date no test was possible. A test was then carried out between uncertainty at the two-year image date and ability to state plans at the five-year image date. No association was established. Secondly, statistical tests also failed to establish any significant association between the degree of uncertainty attached to milk price expectations and cow numbers, milk output or capital investment.

From this evidence it would appear on first sight that while producers formulate expectations of milk prices, they accord them little weight and make adjustments and changes in their farming systems for other reasons. It is tempting to arrive at this conclusion, particularly in view of the lack of precision and general lack of confidence exhibited by many producers in stating their expectations. Considering the nature of this enquiry, however, it would be too dogmatic to state such a conclusion and probably more realistic to recognise that the role of expectations in the management process is not easy to establish and is likely to be part of a complex area of the decision-making process¹.

A priori reasoning would in any case suggest that these relationships could work in a variety of ways. For example, those producers who view the future with the greatest degree of confidence and are able to make expectations within a narrow range may anticipate either higher or lower prices. Those who anticipate higher prices may find it economic to produce more milk, or they may feel that because of higher prices they do not need to make adjustments, or they may conceivably produce less milk on the basis that they will make the same income by keeping less cows. Producers anticipating lower prices may also respond in a variety of ways according to their situation including their capital position, attitudes to risk and their desire for increased profits. Expectations could still, therefore, have an important influence on plans.

Nevertheless, the overall results of the tests are clearly confirmed by the answers producers gave to a direct question as to whether or not their price expectations for milk were directly influencing their milk production plans at the time of the interview. The views and statements of producers in answers to this question provide some valuable insights into the problem. Briefly, the overwhelming majority said that expectations were not influencing their plans for one or more of a number of reasons. These include the fact that they consider prices only at the time of making major changes and many had recently made a major change in organisation or already had a long-term plan in operation. When producers make these major changes they tend to take a long-term view of the prospects for the industry in which price expectations are only one of the considerations. Others say they are conscious of trends but

¹It should also be remembered that failure to establish significant association in the tests should not be taken as proof of no relationship. It simply means that the case against the initial assumption (that there is no relationship between the factors) is not proven and that either better theories or more empirical evidence are necessary.

often feel unable to make changes. Some state that it is the cost of production, and price expectations for inputs, which mainly influence their farm plans.

Producers' expectations concerning the relative prices for milk and other farm products provide further evidence to support the view that product price expectations have little direct effect on farm plans. Two important points emerge. First, the majority of producers (three out of four) see no significant changes in the longer run in the relative prices for milk and other farm products and therefore see no justification for making changes on this score. Second, those who did envisage a change in relative prices were asked if these expectations were affecting farm plans. Again, the majority stated that their anticipations were not affecting plans because they already had long-term plans in operation or felt they had no alternatives to dairying, or they would wait for more concrete signs of the price changes they envisaged before taking action.

However, whilst no association appeared to exist between milk price expectations and either choice of enterprises or the level of milk output, it will be recalled that in Table 16 an association was established between expectations and the level of capital investment in dairying (excluding investment in livestock). On this evidence it would appear that a producer predicting lower prices in the future is likely to delay investment, but another confidently anticipating higher prices is likely to be prepared to go ahead with planned investment. This relationship therefore indicates that, in the first instance at least, product price expectations are more likely to influence the methods of milk production rather than the level of output as such.

Uncertainty about future prices may affect the farm business and farm plans in other ways. For example, farmers who feel more uncertain about the future may adopt a number of precautionary measures which are designed to combat uncertainty. They may take the form of (a) measures to reduce variability in income or to prevent it falling below some minimum level or (b) measures designed to increase the farmer's ability to withstand unfavourable economic conditions. Diversification and flexibility are the more obvious examples of these measures. Heady (1952) states that as an uncertainty precaution, diversification is generally adopted to lessen income variability or the probability of income falling below some critical level. In contrast, flexibility may be incorporated into production plans both to lessen income variability and to allow changes in plans as time passes and as the ability to predict the future improves. In this way opportunities for higher profits may not be missed. An attempt was therefore made to see if any of these measures could be identified with the sample farms and associated with the degree of uncertainty attached to product price expectations.

Flexibility was considered first and since it was thought too difficult to question producers on future intentions in this respect, all producers were asked if they could think of any ways in which they had recently made their farming more flexible or more adaptable to change. They were then classified into two groups, those who said that they had made changes of this nature and gave examples, and those who had made no such changes. A statistical test of association was then made between

the degree of uncertainty and producers' attitudes to flexibility. The result of the test, given in Table 16, shows that no relationship was established.

Secondly, all producers were asked if they intended to diversify their system in the future. The replies indicated that practically none had intentions of this nature. Hence it was not possible to establish any relationship. A further attempt was made to find any association between these two factors by classifying the group according to whether they had diversified their systems in the recent past. Statistical tests again failed to establish any association between these factors.

In conclusion then, the evidence on the influence of milk price expectations on farm plans suggest that:—

(1) While the majority of producers formulate some expectations of future milk prices, many apparently only make detailed expectations for the purpose of calculating returns or constructing budgets at the time of making major changes and are probably content with little precision in their forecasts in the meantime. Product price expectations, therefore, while no doubt affecting producers' confidence in the future, appear to have little direct effect on production plans in the short-term. When changes are made, expectations are only one of a number of factors considered.

(2) Expectations of the relative prices for milk and other farm products, and the influence of these expectations on plans, provide further evidence to support the view that product price expectations have little direct effect on production plans.

(3) Producers' statements and behaviour suggest a rigidity in many farming systems and a general inability to react or adjust to product price changes. This appears to be bound up with either a lack of real alternatives to milk production on many of the farms or the farmers' inability, for technical or other reasons, to change systems even when alternatives are available. In other words, the relationship between product price expectations and production plans does not appear to be one of the most responsive parts of the management process.

(4) The evidence from this sample of farms indicated a relationship between investment and expectations rather than output and expectations suggesting that product price expectations are likely to influence the methods of milk production.

(5) Producers seemed to be aware of precautionary measures that could be adopted to combat uncertainty. Many were well aware of and using the flexibility principle. On the other hand it appeared that few intended to diversify their systems in the future.

OTHER EXPECTATIONS AND PRODUCTION PLANS

Input Prices

In contrast with the small proportion of producers who said that product price expectations were influencing plans, about one half of the sample maintained that their expectations of prices and market conditions for inputs were influencing plans. Many producers were quite definite about this saying that these were the main consideration on which they based their adjustments. Not only were changes being made

but many producers clearly stated they were making their changes on account of probable trends in the future prices of certain specific inputs. Examples were the expenditure on labour-saving buildings because of the conviction that wage rates would continue to rise in the future and the growing of more homegrown grain and other foods because of an expected rise in the price of concentrate foods in the future.

This evidence would suggest two points. First, that while there may be inflexibility in the choice of products, farmers feel they have greater choice in the way they produce a given product and of the inputs they use. Second, that although this study did not examine in detail the extent to which producers go in formulating expectations for inputs, it is clear that many are able to make expectations with sufficient clarity and conviction to directly influence farm plans. It might be wondered whether this difference between product and input expectations is a reflection of the degree of uncertainty inherent in the future prices and market conditions for inputs or simply an indication of the scope for input substitution.

New Technology

The majority of producers interviewed anticipate changes in farming methods and when asked if they try to take these into account in their planning, the majority again said that they do. However, when questioned as to how they attempt to do this, many producers seemed to be in considerable difficulty and gave confused and incoherent answers. This situation is no doubt partly due to the type of expectations they are able to make in this field. In other words, the majority of producers anticipate change but the extent to which they are able to go in formulating detailed expectations is another matter. It was stated earlier in this report that when forecasting an outcome of a continuing series, like the price of milk or the cost of feed, the manager has past experience on which to base his expectations of future outcomes. But when the number of preceding similar events declines in number, the point is approached where little can be learned from experience. Some new techniques in farming are developed as a result of farmers' needs and problems and at the request of farmers and therefore may be anticipated, but many innovations would fall more nearly in the category where the number of preceding similar events is small and little can be learned from past experience. Hence, when some producers reply, "How can we take these things into account when we do not know what the changes are?", it is tempting to argue that expectations in this field can have little effect on farm plans. An examination of producers' replies, however, indicates that although there may be no direct effect on plans expectations in this field have an indirect effect by stimulating producers to take precautions against the uncertainties of the future. Firstly, many producers stressed the need for adaptability in making investments. With regard to buildings, for example, this may take the form of covered yards which may be used for a number of classes of stock, or storage barns which have alternative uses. Other equipment and machinery is installed in such a way that it can be moved, added to or modified to meet a variety of possible future situations. Other producers thought more in terms of time flexibility which is based on the principle that a short-lived resource provides greater

flexibility than durable equipment. One piece of equipment designed to last ten years may incur a greater annual cost than a more expensive building with a longer life. Yet flexibility exists with the first building since the operator has a periodic opportunity to re-appraise the future. Others were using the same principle by taking steps to write off their investments during a relatively short period in order to preserve their capital and be in a position to take advantage of new advances in technology.

Future uncertainties and expectations in this field evidently represent a difficult phase of the management process for many farmers. Their statements indicate that the effect of their expectations in this field is of an indirect nature. Typically they tend to wait until innovations have been well tried before they consider adopting them. In the meantime, they anticipate change and try to adopt measures such as those already outlined in an attempt to combat the effects of uncertainty.

Institutional Arrangements

Earlier analysis has shown that the majority of producers hold some views regarding future changes in the institutional environment. When asked if they take possible changes into account in their plans, a few said no, rather more said yes, but by far the biggest proportion either could not answer the question or gave confused answers. Whilst many were acutely concerned as to what would happen in the future, they appeared to exhibit little logical thinking on which to base either expectations or plans. As in the case of technological change, experience seems to provide only a limited basis for forecasting future changes¹.

This brief questioning of producers therefore has shown that while many formulate general expectations, few seem able to make detailed expectations on which to plan. The only thing the more enterprising operators appear to be able to do is to be in a position to make changes when the time comes. The paradox is that farmers generally are aware of the overwhelming importance of government action in farming but apart from a knowledge of the general trend in government policy, few appear to have much confidence in their anticipations of future changes. However, it is also clear that much more detailed research than attempted in this study is necessary to get a clearer picture of these problems, including the relationship between general expectations in this field and the government action models so widely used for predicting future product and input prices.

¹A representative sample of the more coherent replies would be:—

“No, I do not adjust to what the government might do, definitely not.”

“The only thing to do is to try and cope with changes when they come.”

“I listen and live in hope.”

“How can you adjust until you know what the changes are?”

“It is impossible to adjust to future changes other than try to be in as efficient a position as possible.”

“All the time I am conscious of change.”

“I try to be in a position to make changes.”

“I keep possible changes in the back of my mind and plan how I could adjust to these changes. I wouldn't like them to come as a shock to me.”

“I have a plan which I think is right for the future and in line with government policy.”

BASIC APPROACH OF PRODUCERS TO FARM ORGANISATION AND STATED REASONS FOR ADJUSTMENTS

Finally an attempt was made to throw additional light on the relationship between expectations and plans by considering the problem from a different angle. In an attempt to determine the basic approach to farm organisation on the sample farms, all producers were asked what they thought were the most important factors which determined the enterprises they had on their farms. The object of this line of enquiry was to elucidate the factors or combination of factors which managers regard as fixed or constant in their analyses and which constitute the primary influence on organisation. The question was of the open-ended, unstructured type but the definite way in which producers answered indicated that they had a general approach in mind which aided or directed them in organising their farms. The results are given in Table 17.

TABLE 17

CLASSIFICATION OF PRODUCERS ACCORDING TO THEIR BASIC APPROACH TO FARM ORGANISATION.

40 producers

<i>Basic Approach to Farm Organisation</i>	<i>Per cent. of Producers</i>
Land use	45.0
Profitability or income	22.5
Price, price expectations or outlook	10.0
Personal preference	10.0
Labour	5.0
Habit	2.5
Government restriction	2.5
Other	2.5
Total	100.0

About one half the sample appeared to rely on approaches which involved fitting the farm business to the characteristics of important fixed inputs such as land or labour. The relative importance of the land use approach indicates that many producers consider land to be relatively more fixed than other factors or that the nature and characteristics of land impose over-riding limitations on choice of organisation. Together with other factors such as personal preference, this emphasis on fixed elements goes some way to explain the rigidity and inflexibility of many farming systems, particularly in relation to short-term economic changes. Only one-third of producers said that the main factor influencing choice of enterprise was concerned with either prices, income or profitability considerations, and the majority of these seemed to be concerned with overall profitability rather than prices as such.

Producers were also questioned as to the adjustments they had recently made to their dairy enterprise and the changes they intended to make in the future. A full description of each intended change was

TABLE 18

**CLASSIFICATION OF PRODUCERS ACCORDING TO THEIR
REASONS FOR INTENDED ADJUSTMENTS.**

<i>Adjusted or conformed to</i>	<i>Per cent. of Producers</i>
Feed supply or livestock plan	57.5
Price, price changes or price expectations	42.5
Profit or income considerations	37.5
Buildings and equipment considerations	25.0
Land and cropping patterns	17.5
Labour considerations	10.0
Other	2.5

recorded together with the reasons for making the change. Some respondents had plans for little change while others had definite plans for four or five adjustments and gave a number of reasons for each intended adjustment. These reasons have been analysed and classified according to general category in Table 18. Provided a producer gave the reason in question as at least one of the reasons for one of the intended adjustments, he was included in that category. This classification therefore does not fully indicate how often each factor was given but records the number of producers who stated each reason at least once.

This evidence indicates that many changes were made because of technical reasons associated with feed supplies, livestock programmes, buildings, labour, cropping or other such considerations and that these adjustments were probably stages in the execution of a pre-determined plan. Heady, Hildreth and Dean (1957) argue that not all the investment decisions made by farmers are of a "studied" nature, where the manager evaluates the consequences of the decision in the light of his future expectations. Some decisions are made with little conscious planning and should therefore be considered as "routine" or "forced action" decisions. Thornton (1962) suggests that in the short-term the firm may have a normal function or production and the primary interest of the manager is to keep the firm functioning close to this norm. The norm may be re-established from time to time but in the short term it is conceivable that the manager largely acts in a repetitive manner.

The data in Table 18 indicate, however, that in planning for adjustments nearly one-half of the sample did, for one adjustment or another, consider prices. Of 24 instances where prices were considered, 20 involved future prices (expectations) as opposed to current prices and of these 14 were for inputs and 6 for products. This evidence therefore supports the earlier analysis which showed that while product price expectations may have little effect on farm plans, price expectations for inputs are more widely considered and taken into account.

V. SUMMARY AND CONCLUSIONS

In the business world, expectations provide a link between the present and the future and are one of the keys to an understanding of the management process. This report presents the results of an exploratory study which sought to determine the nature and foundations of the expectations held by a group of milk producers in South West England and how these expectations affect the exercise of the management function. A questionnaire was completed by personal interview with each farmer.

The first of the three main sections of the report outlines theoretical concepts and reviews previous research in this field. It is emphasised that in reality the farmer is faced with problems of production and resource use when there is imperfect knowledge of the future. Risk and uncertainty are defined; uncertainty represents the situation where an outcome cannot be established in an empirical or quantitative sense. Nevertheless, the farmer must anticipate the future in order to plan his business and the latest research on expectations in the U.S.A. suggests that he needs to formulate expectations of prices, production, institutional arrangements and the behaviour of people associated with the farm business. Previous research has also demonstrated that it is possible to classify expectations according to type of event, clarity and precision and also the degree of certainty with which they are held. Moreover, the expectation models or frameworks which provide the foundations for expectations have received increasing attention. Yet a review of recent research in the field would indicate that little empirical work has been undertaken to establish these theories and the role of expectations in the managerial process.

The second part of the report describes and analyses the expectations of the group of farmers interviewed, devoting particular emphasis to price expectations for milk. It was found that practically all producers were prepared to make a general forecast about the direction of price movement in two years' time but only two out of three felt able to state specific expectations in the form of a highest probable, a lowest probable and a most probable price. The possible shape of the individual (subjective) probability distributions was investigated and a rating of uncertainty was calculated for each producer. Uncertainty increased for a more distant image date. No association was established between the degree of uncertainty attached to price expectations for milk at the two-year image date and a number of social and economic characteristics of the farmer and his business. The evidence also indicated that producers felt able to formulate general expectations of the relative prices for milk and other farm products. The systems of reasoning or expectation models which are the foundations of producers' anticipations were also examined. At the two-year image date twelve different models were discernible and the four most widely used models were (a) government action, (b) supply, (c) cost of production and (d) lag or extension of recent or current events. Producers stating expectations with less uncertainty used rather fewer models and less government action but more demand and cost of production models. A somewhat different set of models were used at the five-year image date.

Answers to probing questions demonstrated that farmers also formulate expectations of future prices of inputs. No specific expectations were called for in this study, but the expectation models most frequently used have been analysed and shown to be rather similar to those used for predicting milk prices. All producers held expectations regarding new technology in dairying during a given time period, with two out of three producers envisaging changes. In this field of uncertainty a trend or production needs model was most frequently used. Limited questioning also showed that farmers formulate expectations of changes in the political and institutional environment. The models used, together with impressions gained during the interviews, indicate that while producers are aware of the importance of government action and other institutional arrangements, they are only able to formulate these expectations in very general terms. Of the information categories or types of uncertainty considered, producers regarded future changes in the institutional environment as the most difficult to predict.

The third section of the report outlines producers' production plans and includes an assessment of the influence of expectations on these plans. Most attention was again given to milk price expectations and a number of statistical tests were made to establish associations. No association could be established between the level of expected prices and future cow numbers or future milk output, but an association was found between the level of expected milk prices and the level of capital investment. No association could be established between the degree of uncertainty attached to milk price expectations and either ability to state future plans, future cow numbers, future milk output, the level of capital investment or certain other farm adjustments. Producers' answers to direct questions on these relationships appeared to support the above results and also provide insights into the problem. Many only make specific price expectations and consider prices when making major changes and at these times product price expectations are only one of a number of factors taken into account. Some stated they were conscious of trends but often felt unable to make changes. Others stated that it was the cost of production, and price expectations for inputs therefore, which mainly influenced their farm plans. Although limited data on the influence of the other types of expectations were collected, the study suggested that price expectations for inputs have more influence than product price expectations on plans. Thus while no relationship could be established between milk price expectations and either the choice of enterprise or the level of milk output, the evidence did indicate that both product price and input price expectations influence investment in dairying and therefore the methods of milk production.

The effect of expectations regarding new technology seem to be largely of an indirect nature, stimulating farmers to adopt measures such as flexibility to combat uncertainty. Expectations of changes in the political and institutional environment also appear to have a mainly indirect effect. An approach to the problem from the point of view of producers' basic approach to farm organisation and their stated reasons for future adjustments, tended to support the earlier analysis and indicated that in the short run, many of the reasons for adjustments were of a technical nature and were probably made in the execution of some

pre-determined plan. This approach again demonstrated the importance of input price expectations.

Finally, two general conclusions and some suggestions for future research stem from this study. The first conclusion is that in spite of government action involving price supports and guaranteed markets, and various other institutional arrangements, this study has clearly shown that farmers feel uncertain about the future. In other words, the problem of uncertainty for the manager is a very real one.

Second, although this and earlier studies have provided knowledge of some aspects of farmers' expectations and plans, it would seem that these expectations and plans are affected by economic, social, political and psychological factors, many of which are difficult to measure. Enquiries of this type, dealing with thought processes and human behaviour, are subject to many difficulties and it is not easy to establish clear relationships. There is a need for better theoretical models and sharper measuring tools for empirical research before it is possible to reach a better understanding of these areas of the management process. A number of suggestions for future research are posed by this study.

An important field of study appears to exist concerning input price expectations and their role in decision-making. In addition to technical uncertainty, dealing with yield and production response, the newer field of human expectations needs development. Future research will need to investigate the expectation models used by farmers in more detail and describe how they aggregate the effect of two or more models to give a single expectation. Better measurements or ratings of uncertainty are required. The degree of belief approach or potential surprise function as outlined by Shackle (1949) offers possibilities. What are the relationships between expectations of different types of uncertainty? Are all expectations eventually reflected as market or price uncertainties? What knowledge is needed about other areas of the management process before the role of expectations can be clearly established?

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APPENDICES

- (i) The Survey Questionnaire
- (ii) Presentation card with Information Categories.

SURVEY QUESTIONNAIRE

Farm Number.....

Part I Adjustments to the Dairy Enterprise

(1) *Current Adjustments*

What changes or different methods have been or are being adopted ?

Reasons for changes ?

Investment changes ?

Associated changes in :—

Cow numbers ?

Milk yield per cow ?

(2) *Future Adjustments*

What changes do you intend to make in the near future ?

Reasons for changes ?

Investment changes ?

Associated changes in :—

Cow numbers ?

Milk yield per cow ?

(3) *Bearing your future plans in mind, what is your estimate of your :—*

(a) Herd size in	(b) Milk yield per cow in
1 year's time.....	1 year's time.....
2 years' time.....	2 years' time.....
5 years' time.....	5 years' time.....

Part II Producers' Expectations

(1) In general, what kinds of things ought a farmer to know about to operate a farm for profit ?

(2) Here is a list of four kinds of information which you have probably used to make decision about your farming. (See Page 51.)

(a) In the light of your experience, which of these four kinds do you think is the most important in running a farm for profit ?

Rank 1.....

Which is the next important ? Rank 2.....

Which is least important ? Rank 4.....

(b) We live in a changing world and have to make plans with imperfect knowledge about the future. Which of these four kinds of information gives you the most difficulty with regard to forecasting possible future changes ?

Rank 1.....

Which is next most difficult ? Rank 2.....

Which is least difficult ? Rank 4.....

(3) Do you think the price of milk in two years' time will be higher, lower or about same as this year ?

.....Higher

.....Lower

.....About Same

.....Don't know

Still, if you had to make a prediction now, what things would you try to take into account in making an estimate ?

.....

Could you tell me how you have arrived at this estimate ?.....

.....

.....

(If no general model given above, ask the following)

(a) In general, what circumstances would lead you to expect a fall in the price of milk ?.....

(b) In general, what circumstances would lead you to expect an increase in the price of milk ?

(For all respondents answering first part of question.)

You said earlier that you thought the price of milk in two years' time would be now. What is your estimate of the : —

.....Highest probable price Lowest probable price

.....Most probable price.

Are you making any changes at the present time as a result of your estimate of future prices?.....No.....Yes, then what are they?

Do you think the price of milk in five years' time will be higher, lower or about the same as this year?

-Higher
-Lower
-Don't know

What would be your estimate of the
.....Highest probable price
.....Lowest probable price
.....Most probable price

Could you tell me how you have arrived at these estimates?

.....

(4) Milk producers buy many things to operate their farms. Feed, labour, fertilisers, seeds and machinery are some examples. Which items concern you most from the point of view of probable cost in the future? (ranked according to the amount of concern).....

.....

Under what conditions do you assume that the prices you will be paying for (first mentioned input) will be higher than they are now?

Under what conditions do you assume that the prices you will be paying for (first mentioned input) will be lower than they are now?

Are your expectations of future trends in the cost of any of the things you buy influencing your farm plans at the moment?
.....NoYes. If yes, then how?

.....

(5) Do you think there will be changes in farming methods and techniques in dairying during the next two years?

-Yes What reasons have you for thinking this way?
- For what kind of things do you anticipate changes?
-No What reasons have you for thinking this way?
-Change and no change just as likely
-Don't know

Do you try and take possible changes into account in your planning?.....

.....No..... Yes

How do you try to do this?

.....

(6) Do you think there will be changes in government policy or other national schemes for dairy farmers during the next two years?

.....Yes

What reasons have you for thinking this way?

What kind of changes do you anticipate?

.....No

What reasons have you for thinking this way?

.....Change and no change just as likely

.....Don't know

Do you try and take possible changes into account in your planning?

.....NoYes

How do you try to do this?

.....

Part III Policy and other Considerations

(1) What do you think are the most important factors which determine the enterprises which you have on this farm?.....

.....

(2) For your farm and your circumstances, what do you think are the alternatives to milk production?

.....

(3) Do you envisage any significant changes in the relative prices of milk and other farm products in the near future? No Yes

If yes, then what do you have in mind?

How will this affect your farm plans?

(4) Can you think of any ways in which you have deliberately made your farming more flexible or more adaptable to change in recent years?No Yes, then can you say how?.....

- (5) During the last three years have you added other crop or livestock enterprises for the main purpose of getting your eggs in more baskets ?Yes, then how have you done this ?.....

No, then have you cut down on the number of enterprises?
NoYes, then if so how and why ?
- (6) Do you think you will try to diversify your farming or specialise in the future ?
Diversify, How and why ?
Specialise, How and why ?
Neither
- (7) How far ahead do you think it is possible to plan ?
- (8) What do you think are your main problems as a milk producer at the present time ?
-

Note : Background data on farmer's age group, years of managerial experience, tenure status and statistics of farm size, herd size, milk output and net farm income were available to support the survey data.

PRESENTATION CARD WITH INFORMATION CATEGORIES

(as used in the Questionnaire Survey)

1. **GOVERNMENT AND OTHER NATIONAL PROGRAMMES:** Information on government actions and other national programmes and their effect in farming.

Examples

Subsidies and grants	Income Tax
Marketing Boards	Co-operative movements
Milk quotas	Common Market proposals
Acreage controls	Small Farmer Scheme

2. **PRODUCTION FACTORS:** Information on all farm practices, methods of production and things used in the production of live-stock and crops.

Examples

Types of buildings	Variation in yields
Milking methods	Crop varieties
Feeding rates	Conservation methods
Fertiliser practice	Storage methods

3. **HUMAN FACTORS:** Information about individuals a farmer has to consider or deal with in making decisions about his farm.

Examples

Family members	Salesmen
Relatives	Bank Manager
Hired workers	Advisory Officer
Neighbours and friends	Other people

4. **PRICES:** Information on prices received for farm products and prices paid for items used in farm production.

Examples

Pool prices for milk	Feed prices
Premiums for milk	Machinery prices
Calf prices	Wage rates
Beef prices	Interest rates

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