

**DANISH CONSUMERS' ATTITUDES TO
THE FUNCTIONAL AND ENVIRON-
MENTAL CHARACTERISTICS OF
FOOD PACKAGING**

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EXECUTIVE SUMMARY

The purpose of the studies presented in the paper is to research different aspects of Danish consumers' views about the functional and environmental consequences of packaging, as well as to study cognitive barriers that can prevent consumer attitudes to environmental consequences of food packaging to influence the buying of food products. The results of these studies will be employed to consider whether and how to influence Danish consumers to buy products with environmentally sustainable packaging.

As the project concerns both consumers' attitudes to packaging on the abstract and on the more specific levels, because of the social sensibility of environmental issues, and owing to the fact that it is difficult to establish any aim for the external validity of the studies, it is chosen to use four different methods of data collection.

The point of purchase study is based on personal interviews with customers in selected supermarkets in Aarhus, Odense and Copenhagen. The data consists of 351 interviews distributed on four different food-products (cheese spread, butter products, orange juice and ketchup).

The results indicate, not surprisingly, that packaging influences the actual buying decisions of consumers. Although this is not true for the environmental aspects of packaging. Between 16 and 37% (for the four different products) of the respondents mentioned functional packaging among other product attributes, when given a sequence of open questions as to why they had chosen the specific product. Only one out of the 351 respondents mentioned the environmental consequences of packaging when asked openly about the reasons for choosing the specific product.

The laddering study aimed at exploring the nature and the extent of consumers' associations between their personal values and their attitudes to specific packaging. 72 consumers were interviewed in their homes concerning the packaging of the product types (cheese spread, butter or orange juice) they had been interviewed about in the point-of-purchase study.

The results indicated that the environmental consequences of packaging are associated with personal values more often than the functional consequences. This implies that many consumers are personally involved in the environmental consequences of packaging.

The conjoint study investigated the relative importance of different packaging attributes and other product attributes with regard to the consumers' preference for cheese spread. Because it is assumed that consumers have a limited ability to distinguish between the environmental consequences of different packaging attributes, the study was based on illustrations of imaginary products, of which some were furnished with a recycling label. Beyond the 'recycling' variable the conjoint study was based on four other variables (fat-content, price, reseal and packaging material).

The collected data consist of 156 interviews with consumers in four supermarkets in the Aarhus and Copenhagen areas. On the basis of a linear compensatory model, aggregated and individual utility functions were estimated. These functions indicated, as expected, that the content of food products to most consumers are more important than the packaging. But the results also indicate that recyclable packaging is preferred by most consumers.

The purpose of the *goals and tactics study* is to a) investigate whether consumers perceive a reduction in the problems connected to packaging waste as important compared to the solution of other environmental and societal problems, and b) to detect which responsibilities the consumers conceive regarding the solution of the packaging problem.

The data consist of 222 telephone interviews with a representative sample of the adult Danish population. The results show that consumers in general perceive the garbage problems as less serious than other environmental problems (air and water pollution). However, when asked specifically about household waste, most consumers assess packaging waste to be more environmentally harmful than the other fractions of household waste.

Only every sixth Danish consumer thinks that consumers themselves bear the main responsibility for the solution of the problems connected to packaging waste. Most of the respondents pointed at the industry in general and at the public authorities.

Together the results of the four studies indicate a) that many consumers are concerned about the environmental consequences of packaging (other environmental problems are perceived as more serious, however), b) that this concern is influenced by the personal values of consumers, c) which can imply a preference for environmentally sustainable packaging, but d) that such a preference seldom has any effect on the buying of food products, because consumers are unable to distinguish between more and less environmentally benign packaging, because other preferences are more important to the consumer and owing to the fact that the buying of food products often is habitualized.

On the basis of the results, recommendations are given concerning how the packaging and food producers may prosper from the demand for environmentally benign packaging and how the public authorities may stimulate this demand.

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Packaging waste is one of the most conspicuous environmental problems of modern times. Every day, consumers throw away vast quantities of empty packaging, which many feel is a needless waste. In their irritation, however, many consumers often forget that packaging is also an important prerequisite for the shelf life and functionality of food products, not to mention an effective means of communicating their identity and quality.

This paper presents the results of a study of Danish consumers' attitudes to packaging and the importance of the environmental and functional characteristics of packaging for their purchasing decisions. The paper starts with a brief description of the background and aim of the study. This is followed by a resume of the theoretical and methodological basis of the studies. A more detailed discussion of theory and method appears in Bech-Larsen (1995). The present paper concludes with a discussion of the implications of the results for the Danish environmental authorities and Danish food and packaging manufacturers.

1. BACKGROUND AND AIM OF THE STUDY

Research shows that consumers in many European countries regard packaging as a serious source of environmental pollution (Dichter Institute, 1987; Holland, Pfirrmann & Jakobs, 1989; Faller, 1990). So far, however, there has been no study of the extent to which consumer concern about packaging's environmental consequences affects their purchase of prepacked everyday products.

While the use of packaging in Denmark has increased steadily over a number of years, the proportion of packaging in household waste still only constitutes about 7% of the country's total waste production. The environmental problems caused by households' packaging waste must therefore be considered relatively modest.

The increase in packaging consumption is related to a number of demand tendencies, which in turn are related to the growth in the number of women in the labour market and the general 'modernisation' of consumption. Modern packaging for processed food products is more difficult to recycle than more traditional packaging. However, since food keeps better in modern packaging, which results in less food being thrown away, its environmental effects are not unequivocally negative. Nevertheless, due to the increasing use of packaging, consumers are likely to become more concerned about its environmental consequences in future. The reason for this is simple – packaging waste is a highly visible element in consumers' daily lives. Another reason is that packaging is increasingly made of plastic and other materials, which many consumers regard as environmentally harmful (Holland et al., 1989; Copaco, 1991).

Both the packaging industry (EMSA, 1992) and the authorities (the Danish Department of the Environment, 1992) are well aware of the environmental problems caused by packaging, and both seem to agree that they should be solved through a stimulation of market forces. This is best done on the basis of empirical studies of consumer attitudes to packaging's environmental consequences and the effect which these attitudes have on consumers' purchasing behaviour. Firstly, such knowledge about consumer attitudes is essential to the success of information campaigns on the environmental consequences of packaging, as recommended in the EU Commission's packaging directive (1993).

Secondly, the results of such studies can be used to evaluate the extent to which consumer attitudes to packaging's environmental consequences imply market possibilities or threats for producers of prepacked products.

Packaging is of fundamental importance to both the purchase, use, and disposal of food products (Hansen, 1986). Food packaging stimulates consumers' purchasing because it is a medium of attention, information, quality and aesthetics. Food packaging is typically more important for the storage and use of the contents than the packaging of other everyday products. Finally, empty food containers constitute a bigger proportion of household waste than other types of packaging (Harboe-Jepsen, 1992). This is due both to the high percentage of household budgets used on food and to the fact that food packaging represents a high proportion of the product's weight and volume (Holland et al., 1989).

Despite the relevance of packaging for both purchasing, consumption and disposal behaviour (Hansen, 1986), however, marketing research has up to now almost exclusively focused on purchasing behaviour, primarily with regard to the communicative characteristics of packaging. A review (Bech-Larsen, 1995) of the few studies of consumer attitudes to packaging carried out to date shows that consumers tend to give packaging a negative or positive rating according to the level of abstraction of the question. When asked about their attitudes to packaging in general, there seems to be a tendency to associate it with negative effects on the environment, whereas when asked about specific packaging, consumers tend more to emphasise the positive, functional characteristics.

This paper reports on studies made with the aim of analysing various aspects of consumers' attitudes to the functional and environmental consequences of food packaging; furthermore, the studies cover the psychological barriers which can prevent the latter from influencing purchasing behaviour, in order to evaluate whether and how purchasing behaviour can be influenced in such a way as to limit the environmental problems caused by packaging. The studies deal with consumers' attitudes to both a) packaging in general, and b) the specific packaging which consumers take home with them (primary packaging). Consumers' attitudes to various industrial, transportation and storage packaging are not explicitly included in the analysis.

It should be noted here that, in general, a certain discrepancy must be expected between consumers' attitudes to the environmental consequences of food packaging and their actual purchasing behaviour. This is because purchasing behaviour is influenced by a wide variety of attitudes and other factors, including the purchasing situation and the consumer's knowledge about alternative products. The consumer's attitude to packaging's environmental consequences is thus only one of a large number of factors which influence purchasing behaviour.

2. PRELIMINARY STUDY

Since few studies of consumer attitudes to the functional and environmental characteristics of packaging have been made up till now, the empirical part of the present study started with an explorative study (Bech-Larsen, 1993). The aim of this study was a) to obtain an initial insight into whether and how the functional and environmental characteristics of food packaging influence consumers' purchasing decisions, and b) to test the ability of various interview methods to generate knowledge about these factors. With regard to the previous considerations concerning the level of abstraction and consumers' emphasis on the negative environmental impact of packaging or its positive functional characteristics, two interview methods have been chosen so that both consumers' attitudes to specific packaging and to the more general consequences of packaging can be analysed.

The two methods used were a) point of purchase interviews, the aim of which were to discover whether packaging characteristics function as criteria for consumers' choice of concrete alternatives in a purchasing situation, and b) in-depth interviews, in which a selected group of those respondents interviewed in the point of purchase interviews were asked about the importance of the packaging for the purchase, use and disposal of the same types of food products.

The point of purchase interviews were carried out (n=57) in a supermarket (Bech-Larsen, 1995) immediately after they had put a ketchup, mayonnaise, or 'remoulade' product (subsequently called ketchup, etc.) in their shopping trolley/basket. They were then asked, using open questions, to say why they chose that particular product: *I noticed you picked X; what made you choose it?* The question was repeated a number of times in different ways until the respondent was unable to give further reasons for buying it (Bech-Larsen, 1995). In all, 22 out of the 57 respondents mentioned the packaging as a reason for buying the product. But this was almost solely due to the functional characteristics of the packaging. None of the respondents mentioned its environmental characteristics.

The in-depth interview was carried out in the respondent's home by an interviewer with a tape recorder. Since only a limited number of these interviews were to be carried out, it was important to ensure that all the selected consumers had taken the packaging into consideration. A condition for participating in the in-depth interview, therefore, was that respondents spontaneously mentioned the packaging in the point of purchase interview. Of the 22 respondents who had 'spontaneously' mentioned the packaging in the point of purchase interview, 15 agreed to take part in an in-depth interview. Due to illness and holidays, however, it was only possible to interview 12 persons.

Apart from giving a deeper insight into the abstract importance of the packaging's environmental characteristics, the aim of the in-depth interview was to investigate respondents' attitudes to various specific types of packaging and their motives for including packaging characteristics in actual purchasing decisions. It therefore began with the respondent being shown the product which he/she had chosen in connection with the point of purchase interview. Later during the interview, the respondent was shown an assortment of the same product type.

The in-depth interviews confirmed the results of the point of purchase interviews concerning respondents' focus on the functional characteristics of the packaging. Since respondents for the in-depth interview were chosen because they mentioned the packaging in the point of purchase interview, and since mainly functional characteristics were mentioned, it is not surprising that 11 out of the 12 respondents also mentioned these characteristics in the in-depth interview. However, since the two interview types were carried out three weeks apart, it must be presumed that most respondents had forgotten what they said in the point of purchase interview. Furthermore, none of the respondents were told why they were asked to participate in the in-depth interview. In view of this, the above result can be seen as a confirmation of the importance of packaging's functional characteristics for respondents' choice of product in the purchasing situation.

The results of the in-depth interview also indicated that those consumers who are aware of the environmental characteristics of the packaging first become aware of them when faced with an assortment of different kinds of packaging. This agrees well with the finding that environmental characteristics are relative (Henion, 1976). While a product or type of packaging is usually not absolutely environmentally friendly, it can be environmentally friendlier than alternatives. When environmental characteristics are included in consumers' purchasing decisions, they are apparently used to distinguish between different product alternatives. As functional characteristics are typically mentioned before the respondent is shown a product assortment, they are evidently regarded as less relative than environmental characteristics, and are therefore possibly more closely associated with consumers' fundamental motives for buying a particular product.

In the in-depth interview four of the 12 respondents mentioned the environmental consequences of ketchup, etc., packaging of their own accord. Interestingly, all four respondents also mentioned the difficulty/ease of disposing of the packaging in this connection. This shows that there is a conflict between consumers' concern about packaging's sustainability and convenience.

Those respondents, who of their own accord mentioned the environmental characteristics of the packaging in the first part of the interview, were asked whether and how they were able to evaluate the environmental characteristics of different packaging. The answers mainly concerned the packaging material, but unnecessary packaging and environmental information (labels, etc.) were also mentioned. The respondents were sceptical about the credibility of environmental information, however. Generally speaking, the four respondents who mentioned environmental characteristics were uncertain about evaluating them, and they used different criteria to evaluate environmental consequences.

The results of the preliminary study had a decisive influence on the choice and design of methods used in the main part of the study. The most important result of the preliminary point of purchase interviews for ketchup, etc. is that the functional characteristics of the packaging seem to play a big part in consumers' purchasing decisions, whereas environmental characteristics are without importance. In order to examine this more closely, point of purchase interviews were carried out for three other types of food product (cheese spread, orange juice, and butter). The results of the preliminary in-depth interviews indicate that this interview method is a good way of stimulating consumers' more abstract levels of awareness, where considerations concerning packaging's environmental con-

sequences seem mainly to take place. It was therefore also decided to use in-depth interviews as a basis for a more exhaustive study of consumers' attitudes to food packaging.

3. THEORETICAL BASIS OF THE STUDIES

The aim of the studies is to describe consumers' attitudes to packaging at different levels of abstraction, and explain how both general and specific attitudes to packaging can influence consumers' purchasing decisions.

In the following, three different theories are discussed which can be used as a starting point for studies of consumer attitudes and behaviour with regard to packaging:

- a) Means-end theory (eg, Gutman, 1982) describes the relationship between consumers' attitudes to specific product characteristics and their more abstract attitudes and personal values.
- b) The Theory of Planned Behaviour (Ajzen, 1988) can be used to explain how consumers' attitudes to specific product characteristics influence their purchasing intentions – and to explain some of the barriers to this influence.
- c) Broad range consumer behaviour theories (eg, Howard & Sheth, 1969) describe the consumer's decision process and the importance of various product characteristics for the final purchasing decision.

The theoretical starting point of the present study is a heuristic combination of all three theories. Below, we briefly describe each of the three theories and their relevance to an analysis of consumer attitudes to packaging and the purchase of food products. This is followed by a figure which illustrates how the three theories can together be used as a basis for analysing consumers' attitudes to packaging and their purchase of prepacked food.

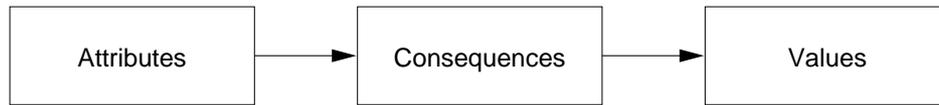
Means-end theory

It has been shown elsewhere (eg Balderjahn, 1988) that there is a connection between consumers' environmental attitudes and their personal values. The analysis of any associations between consumers' personal values and their attitudes to packaging is thus a central element of the study. Personal values describe the individual's overall purpose in life and behavioural norms, and together these affect his/her attitudes to specific objects and types of behaviour (Rokeach, 1973).

An analysis of associations between consumers' personal values and their attitudes to specific packaging requires an understanding of how such associations arise and function, which is where means-end theory (eg, Gutman, 1982) comes in useful. Means-end theory describes the consumer's knowledge about a product or group of products as a cognitive structure, divided into a number of cognitive categories at different levels of abstraction (specific product attributes, the consequences of these, and personal values). Means-end theory is thus based on the fact that the consumer's motives for demanding specific product attri-

butes can often be explained by underlying consequences and personal values. It therefore describes consumers' associations between a product's meanings on three or more levels of abstraction. Figure 1 illustrates a means-end model with three levels of abstraction.

Figure 1. The means-end model



Source: (Olsen, 1989). See Gutman, 1982, for other versions.

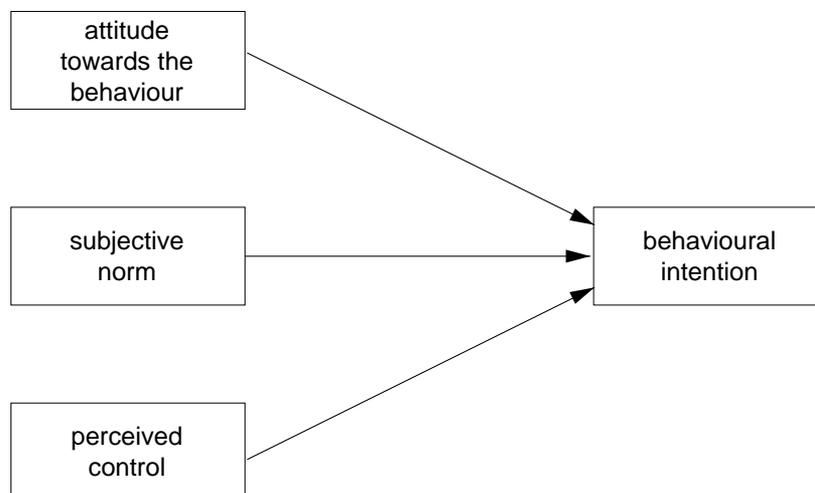
The means-end model illustrates how the consumer's attitudes to attributes (product characteristics) are related to expectations of their consequences and the consumer's own personal values. The model says nothing about the relationship between consumers' attitudes to product characteristics and their intended purchasing behaviour, however.

The Theory of Planned Behaviour

According to the *Theory of Planned Behaviour* (Ajzen, 1988), the individual plans his behaviour on the basis of deliberate considerations of the consequences of that behaviour. These considerations result in an intention – which can be explained on the basis of the following three components:

1) the consumer's personal attitudes to the behaviour, 2) consideration of other person's attitudes to it (subjective norms), and 3) evaluation of the possibility for going through with the behaviour (perceived behavioural control). These three factors determine whether the consumer intends to go through with the behaviour – or not.

Figure 2. The Theory of Planned Behaviour (Ajzen, 1988)



The Theory of Planned Behaviour can explain the consumer's intention to choose reusable packaging rather than disposable packaging by, for example, (a) his attitude to the relative seriousness of the latter's environmental consequences (compared with other environmental and social problems), (b) his perception of friends' attitudes to reusable packaging, and (c) his perception of whether reusable packaging has a positive effect on the environment. These points are discussed further below.

(a) The recession has shifted attention from environmental problems to other social problems in recent years, particularly unemployment and immigration (Eurostat, 1992), though there is still considerable interest in environmental problems (Madsen, Nielsen & Scheby, 1992). Consumers in many countries regard packaging waste as a serious source of environmental problems (Dichter Institute, 1987; Holland et al., 1989; Faller, 1990). It is not certain, however, that consumers regard packaging problems as particularly serious compared with other environmental and social problems. This factor must also be included in the study, because the priority consumers give different environmental problems must be assumed to influence their willingness to help solve the packaging problem.

(b) It must be assumed that subjective norms are less relevant in the present context because they mainly influence consumption which is visible to relevant reference persons. For example, several studies indicate that subjective norms have little importance for the sorting of household waste, including packaging (Pieters, 1991; Johansson, 1993; Bagozzi & Dabholkar, 1994). Like the sorting of household waste, the purchase and use of most food packaging is only visible to the person or persons the consumer lives with. Furthermore, for people who have lived together a long time, subjective norms often become 'internalised', ie converted to personal attitudes (Moisander & Uusitalo, 1994). As a result of these arguments, subjective norms are not explicitly included in the study.

(c) The individual consumer's perception of his own possibility for contributing to a solution of the packaging problem (the concept 'perceived control' in the Theory of Planned Behaviour) probably has a considerable influence on the extent to which he includes the environment in his purchasing considerations. That the perception of personal control is so important in connection with environment-related behaviour is due to the fact that environment-related consumption occurs on a personal level, while their effects can seldom be recognised by the individual (Stern, 1992). For example, consumers will almost never be able to evaluate the effect of an environmentally conscious choice of packaging. Notwithstanding, consumers' daily experience with the disposal of empty packaging probably means that the perceived personal control of an environmentally conscious choice of packaging (eg buying products in reusable containers or without double packaging) can be greater than that of many other kinds of environmentally motivated actions (eg buying ecological products).

That the effect of a choice of sustainable packaging can usually only be registered at an accumulated level means that it is not enough for the individual to believe in his own possibility for helping to reduce packaging-related environmental problems. He would then be less likely to contribute if it were possible to 'free-ride', ie if others could benefit from a better environment without having to bear a personal responsibility for it. From this point of view, it is necessary for the consumer to perceive his own participation as both a sufficient and

necessary condition for a better environment. It must be expected, however, that the consumer feels there must be a connection between those responsible for causing environmental problems and those responsible for solving them. If the consumer feels a personal responsibility for causing environmental problems, then the probability that he will prefer environmentally friendly packaging will, *ceteris paribus*, also be greater.

The Theory of Planned Behaviour's concept of intention is not explicitly included in the analysis. Due to the social sensitivity of the concept, and the desire to discover the extent to which consumers are conscious of their preferences for sustainable and functional packaging in the purchasing situation, we have chosen to analyse consumers' reasons for actual purchases. Thus, Fazio (1986) stresses that attitudes and intentions only influence consumers' actual behaviour to the extent that they are cognitively accessible, in the purchasing situation. Attitudes based on personal experience are generally more accessible than those based on second-hand information (Fazio, 1986). Since consumers' attitudes to packaging's environmental consequences are, among other things, presumably based on their personal experience of disposing of the packaging, this attitude is possibly – though far from certainly – accessible in the purchasing situation. The accessibility of this attitude is a problem, for example, when consumers are very pressed for time (Fazio, 1986), which is nearly always the case with the purchase of food products.

Even though the consumer feels responsible for the packaging problem, regards it as serious, and believes in his own possibility for contributing to its solution, it is far from certain that this will be reflected in actual purchasing behaviour. If the consumer's preferences for a food product and/or container outweighs, and at the same time conflicts with, his preferences for sustainable packaging, then his purchasing behaviour is hardly likely to reflect environmental awareness. Furthermore, due to pressure of time, the short period between one purchase and the next, and the limited financial risks, the consumer cannot be expected to give more than a cursory glance to the characteristics of alternative food products (including the packaging) in an actual purchasing situation.

Broad range consumer behaviour theory

The buying of food is often characterised by force of habit, where the consumer chooses between products in an 'evoked set' (Howard & Sheth, 1969) consisting of the alternatives available at the place of purchase concerned, and which at the same time are acceptable to the consumer. According to Howard and Sheth's consumer behaviour theory (1969), in order to be a criterion for the creation of an 'evoked' set, a product characteristic must a) be able to satisfy the consumer's needs, and b) the brands offered must distinguish themselves from other products as regards the characteristics in question.

Many marketing textbooks (eg Bagozzi, 1986; Kotler, 1991) distinguish between two types of product characteristics: 'core characteristics', which determine whether a consumer wants to buy a product from a given product class at all, and 'peripheral characteristics', which determine the choice of brand. While the packaging is usually peripheral to the consumer's purchasing decision, different characteristics of the packaging (function, environment, and communication) can influence the purchasing decision in various ways. Many functional charac-

teristics (eg keeping quality and hygiene) are complementary to, and necessary for, the satisfaction of those needs which constitute the consumer's real motive for buying a food product. On the other hand, it is more common for the packaging's communication characteristics to differentiate and augment the product in relation to consumers' expectations. Since the wide attention to packaging's environmental characteristics is a relatively new phenomenon, it is also possible that environmental characteristics can augment the product (positively or negatively) in relation to some consumers' expectations.

Consumers can evaluate the quality of the packaging's functional characteristics when buying the product, or at least when they use it. In contrast to evaluating the effect of a convenience-motivated choice of packaging, an evaluation of the effect of a sustainable packaging choice must be based mainly on external sources of information. This increases the likelihood that consumers will regard environmental characteristics as more abstract than functional characteristics. The same applies to environmental characteristics often being 'non-characteristics'. For example, it is normally impossible for consumers to judge whether packaging really is 'PVC free'. Packaging's environmental characteristics are also more 'relative' than the functional characteristics. Environmental characteristics are thus defined as product characteristics which have a positive effect on the environment compared with similar characteristics of substitute products (Henion, 1976).

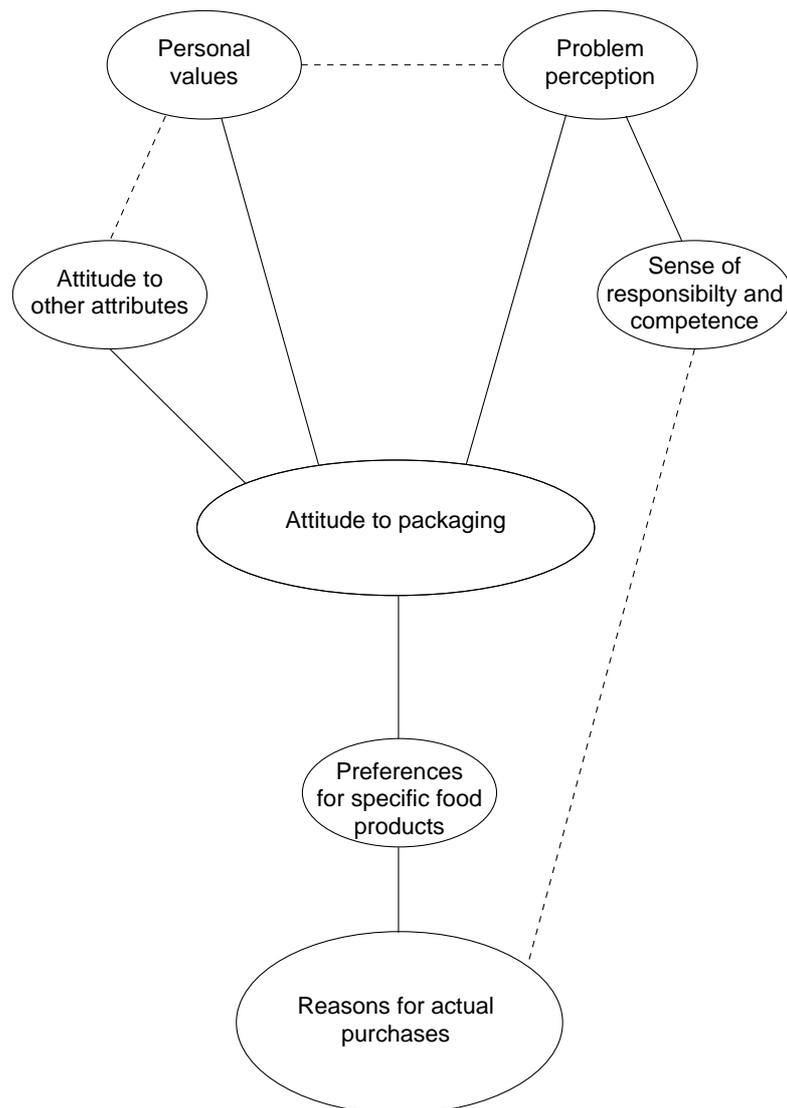
Conceptual framework of the study

The above discussion leads to the conclusion that a thorough analysis of consumers' attitudes to food packaging requires at least an investigation of their:

- a) perception of packaging's environmental consequences as an important environmental problem compared with other environmental and social problems;
- b) general and consumption-specific personal values;
- c) sense of responsibility for the cause of the packaging problem and their confidence that selective purchasing can contribute to its solution;
- d) attitudes to both the functional and environmental characteristics of food packaging;
- e) attitudes to other food characteristics (taste, price, etc.);
- f) overall preferences concerning prepacked food; and
- g) reasons for actual purchases of food, and, in this connection, the accessibility/comprehensibility of any preference for sustainable packaging.

Figure 3 illustrates these factors in a heuristic model.

Figure 3. Conceptual framework of the study



In brief, the conceptual framework describes the consumer's 'attitude to packaging' depending on his 'personal values' and 'problem perception' (the relative seriousness of packaging's environmental consequences compared with other environmental and social problems). 'Attitude to packaging' can influence the consumer's 'preference for specific food products'. The latter is, however, also determined by the consumer's 'attitude to other food characteristics' (eg, price, taste, etc.). Whether the attitude to packaging via 'preferences for specific food products' influences the consumer's 'reasons for actual purchase of food products' is also determined by his sense of 'responsibility' and 'competence' as regards the cause of the packaging problem and the possibility of contributing to its solution through the purchase of environmentally sustainable packaging. The dashed-line connections in the figure will not be analysed here.

Whether consumers' possible positive preference for such packaging influences actual purchasing behaviour will naturally also depend on the availability of such packaging in their usual places of purchase. Due to the limitations of the study, the actual supply of food packaging will not be discussed further here.

4. METHOD

As mentioned, the various aspects of consumers' attitudes to packaging's convenience and sustainability are characterised by varying degrees of abstraction and connection to their actual purchasing behaviour. We have therefore chosen to base the analyses on several different methods. The purpose of this is a) to study the same phenomenon (consumers' attitudes to packaging) from different points of view, and b) to study different aspects of this phenomenon. The latter is important because of the need to study consumers' attitudes to packaging at different levels of abstraction and in different connections. With regard to a), the use of different methods will enable the convergence of the results to be estimated. The use of different methods also agrees well with Lutz' (1991) and Wells' (1993) recommendations on how to improve the relevance and validity of consumer research.

The choice of method and design also takes account of Arndt's (1975) recommendations to the effect that consumer research should broaden its perspectives a) from purchase to use and disposal, and b) from specific brand choices to more general consumption decisions. Even though the present studies focus mainly on the importance of the packaging for consumers' purchasing decisions, the analyses of the more abstract attitudes can also be expected to be relevant to both use and disposal behaviour. Similarly, the analyses must be assumed to be relevant to both the specific and more general consumption decisions concerning packaging.

Based on Arndt's (1975) recommendations, Wells (1993) has drawn up a number of guidelines for the improvement of consumer behaviour research. Among other things, Wells (1993) criticises the fact that consumer behaviour researchers often use students as respondents, and that studies are often carried out in an unrealistic context (in laboratories). According to Wells (1993), studies of consumer behaviour should be based on 'real' consumers' behaviour in authentic consumption situations. This implies, among other things, giving a higher priority to ecological validity (Gill & Johnson, 1991). Wells' guidelines will be followed here as far as possible, which means that data will be collected in such a way as to ensure maximum agreement between the context in which it is collected and the authentic situations where consumers' attitudes and actions are reflected.

Requirements of data collection

As mentioned in section 3, the means-end model (eg, Gutman, 1982), which is an example of a cognitive network theory, is an important part of the basis of the study's empirical methods. Grunert and Grunert (1995) list two criteria for minimising researcher and instrument bias in connection with collecting data about consumers' cognitive networks:

- 1) As far as possible, data must be based on the respondent's thoughts about the subject in hand. Neither the researcher's explicit nor implicit perceptions should be allowed to bias the collection of data if it can be avoided.
- 2) Data collection must be neutral with regard to strategic cognitive processes. If not, the data risks being unrepresentative of the cognitive structures on which the consumer's actual purchasing decisions are based.

The first criterion is best met by the use of open interview methods. Such methods will therefore primarily be used in the survey design. As regards the second criterion, however, while there certainly is a risk that strategic processes can undermine the validity of the data, this risk can be minimised by the use of appropriate designs. Furthermore, the advantages of basing data collection on strategic processes often more than outweigh the disadvantages. Strategic processes are, for example, better than automatic processes at illustrating the profusion of motives and associations which are relevant to consumers' purchasing behaviour (Bech-Larsen, 1995).

What is crucial to the validity of the data, however, is not whether they have been collected via strategic or automatic processes, but that they reflect precisely those cognitive categories and associations relevant to the consumer's purchasing behaviour (Bech-Larsen, 1995). The data should therefore be collected in such a way as to:

- a) ensure maximum contextual agreement with the consumption situation;
- b) stimulate respondents' association concerning the packaging's functional and environmental consequences; and
- c) conceal the relation to the environmental debate.

The last point is due to the social sensitivity of the subject, and involves designing the studies in such a way as to conceal the focus on packaging and packaging's environmental consequences from the respondent – at least until enough data, which is not influenced by this focus, has been collected. With regard to point a), it must again be stressed that the study deals with both functional and environmental packaging characteristics, and that the latter (cf. the results of the preliminary study) cannot be satisfactorily analysed in an authentic purchasing situation (eg, in a supermarket). In the studies affected, measures have been taken to minimise the contextual influence on the results.

Choice of data collection methods

To a very large extent, the design and choice of survey methods used in the main studies are based on the results of the preliminary study. The questionnaire framework of the preliminary study is based on a funnel-shaped design, in which the questions become increasingly 'closed' as the interview proceeds. This design proved to be expedient in terms of minimising the social response (Bech-Larsen, 1995). This design will therefore be used in all the main studies.

The preliminary study also showed that there seemed to be a less prominent social response in the in-depth interviews than in the point of purchase interviews (Bech-Larsen, 1995). This can be explained by the fact that a stimulation of respondents' self-awareness and strategic processes, as occurs during the in-depth interview, can result in more valid and sincere replies (cf. the above discussion on strategic and automatic processes. See also Wicklund, 1982; Dittmar, Beattie & Friese, 1994).

The most noteworthy result of the preliminary point of purchase interviews, however, was that the functional characteristics of the packaging seem to play an im-

portant role in consumers' purchasing decisions. A closer examination of this point requires repeating the point of purchase interviews for other types of food products. This would also make it possible to evaluate whether consumers are aware of their preferences for sustainable and functional packaging in a purchasing situation. However, it is only possible to a limited extent to evaluate the importance of the packaging's functional characteristics compared with other food characteristics (eg, taste). Therefore, a conjoint analysis was chosen (Green & Rao, 1971), which can be used to analyse the relative importance of packaging and other product characteristics for consumers' preferences for specific food products.

The results of the preliminary in-depth interview indicate that this interview method is a good way of stimulating consumers' more abstract levels of awareness, where considerations concerning packaging's environmental consequences seem mainly to take place. It was therefore also decided to use in-depth interviews as a basis for a more exhaustive study of consumers' attitudes to food packaging.

The preliminary point of purchase interviews proved not to be very resource-demanding, as well as being an effective way of finding and selecting respondents for the in-depth interview. The same method will therefore be used for the subsequent in-depth interviews. Like the preliminary in-depth interview, these studies will take a starting point in the products the respondent bought when selected for the point of purchase interview, thereby maintaining a connection between the in-depth interview and actual purchasing behaviour. The subsequent in-depth interviews will not be based on the same method used in the preliminary in-depth interview, however. The reason is that the inductive and rather unstructured method used in the preliminary study (Bech-Larsen, 1995) is very resource-demanding. Instead, the so-called 'laddering method' will be used. This method allows a better structuring of the data collection and analysis.

It was mentioned that, among other things, a thorough analysis of consumers' attitudes to food packaging requires an investigation into whether consumers perceive packaging as a serious problem compared with other environmental and social problems. It was also mentioned that it is necessary to examine the extent to which the consumer feels responsible for the problem and whether he believes he can help solve it through selective purchasing. In order to analyse this, a survey will be carried out of consumers' perception of goals and tactics as regards a solution of packaging-related environmental problems. The 'tactics' part of the 'goals and tactics' survey analyses both consumers' perception of *who* can and should solve the packaging problem (industry, the authorities, consumers) and *how* consumers themselves think they can help solve it. The analysis of 'goals' includes consumers' perception of the relative seriousness of various environmental and social problems.

The analysis mentioned above consists of four studies, all consumer interviews, and based on four different data-collection methods:

1. Personal interviews at the place of purchase.
2. Laddering interviews in the consumers' home.
3. Conjoint experiment in connection with the place of purchase.
4. Goals and tactics interviews with a representative sample of the population.

The four survey methods, together with the survey results, are discussed in the following. Based on a summary of these results, the paper asks whether the environmental problems caused by packaging can be reduced by influencing consumers' purchasing behaviour.

5. THE POINT OF PURCHASE STUDY

The aim of the point of purchase study is to create a basis for evaluating whether consumers include packaging characteristics in their reasons for buying food products. In addition, the point of purchase study was used as a basis for selecting respondents for the laddering survey. Apart from that, the point of purchase study is also intended to help determine whether packaging's functional and environmental characteristics fulfil these requirements.

The point of purchase study is based on personal interviews with customers in selected shops in Aarhus, Odense and Copenhagen who had just put a particular food product in their shopping trolley/basket. The data is based on a total of 351 interviews – 143 on cheese spread, 80 on butter products, 71 on orange juice, and 57 on ketchup, etc. (see Bech-Larsen, 1995, for a breakdown of respondents by sex, age, income and point of purchase). The point of purchase interviews on ketchup, etc., were carried out in May and June, 1992, while the other interviews were carried out in December 1992 and March 1993.

Consumer interviews at the place of purchase are usually called 'point of purchase interviews' (P.O.P.). As a rule, these interviews take place after the product has been paid for. In the present study, however, the interviews will take place immediately after the products have been selected. Other things being equal, this must represent an improvement in validity in relation to point of purchase interviews. Since the point of purchase interviews will be carried out immediately after the products have been selected, the method could also be called 'point of selection'.

The remainder of this section is based on the questionnaire used in the point of purchase interview. The questionnaire is therefore reproduced below:

Questionnaire for the point of purchase interviews

1. I noticed that you chose x (brand).
What influenced your choice? Other reasons?
2. Do you always buy the same brand? Why/why not?
3. Which other x products have you considered buying?
4. Which brands do you prefer? Why? Other reasons?

Explicit questions about the packaging

5. Do you consider the packaging when you buy x products? In what way?
Willing to participate in an in-depth interview?
6. Do you speculate whether the packaging will have any effect on the environment when you buy x products?

Results of the point of purchase study

The respondents' answers have been categorised into a number of purchasing reasons concerning a) the packaging, b) product content, and c) the purchasing process. Table 1 shows the percentage of respondents per reason. For those purchasing reasons concerning 'product characteristics' and 'the purchasing process', the table only represents those categories where at least one of the four product types were mentioned by at least 30% of the respondents (see Bech-Larsen, 1995, for those purchasing reasons which do not meet this requirement). The respondents could specify several reasons for each question, but only the first is recorded in the table.

Table 1. Percentage of respondents per purchasing reason

Number of respondents	Cheese spread n=143		Butter products n=80		Juice n=71		Ketchup etc. n=57	
	Q* 1	Q 1-4	Q 1	Q 1-4	Q 1	Q 1-4	Q 1	Q 1-5**
<i>Packaging attributes</i>								
Function	12	16	22	29	7	14	33	37
Communication	5	6	1	1	0	1	2	4
Environment	0	0	1	1	0	0	0	0
<i>Product attributes</i>								
Taste	57	64	45	74	48	61	33	40
Price	15	20	14	16	46	62	16	28
Health	15	18	29	43	8	8	12	21
<i>Purchasing process</i>								
Variation	13	36	1	5	1	13	12	12
Habit	17	22	29	30	18	21	7	9

* Q refers to questions from the questionnaire for the point of purchase interviews.

** In the ketchup, etc., survey, question 4 was divided into two, the first part asking which product is preferred, while in the second part the respondent was asked to state the reasons for his preferences.

It can be seen from Table 1 that the first reason the respondents mentioned (Q.1) was most often related to the products' taste. Thus, between 33% and 57% of respondents mentioned taste as a reason for buying the four product types (Q.1). As previously stated, the smaller the cognitive effort made to elicit the attitude, the greater the connection between attitude and behaviour (Fazio, 1986). According to Fishbein and Ajzen (1980), there is even a connection between the order in which the characteristics are mentioned and the importance they have for attitudes to an object. If 'top of the mind' is used to express the importance of a purchasing reason for purchasing behaviour, then the distribution of answers to question 1 shows that taste is more important than packaging. It is significant, however, that the functional characteristics of the packaging are mentioned as often as they are.

With regard to the packaging characteristics, Table 1 shows that respondents focus most on function. Common to all four product types is also the fact that the packaging's environmental characteristics hardly seem to be a reason for buying the product at all. Only 1 out of the 351 respondents spontaneously mentioned the environmental characteristics of the packaging. The packaging's communication characteristics are apparently often a reason for buying ketchup, etc., but they have very limited importance for the other three product groups. One reason for this difference could be the fact that several of the products in the ketchup, etc., survey were advertised on television just before the interview.

Table 1 also shows that the purchase of all four products is characterised by habit, and that the purchase of cheese spread in particular is characterised by a search for variation. Open questions such as those employed here can result in respondents giving what they regard as rational answers (Dittmar et al., 1994). Since it must be expected that respondents consider such answers as "I usually do" and "to try something new" as not very rational, the survey probably has an under-representation of reasons related to habit and variation-seeking.

Similarly, it can be argued that purchasing reasons related to the packaging's communicative characteristics are also under-represented in the survey. That only a relatively small percentage of respondents mention communicative characteristics as a purchasing reason can thus be due to the fact that they regard the consequences of communicative characteristics (eg, aesthetic enjoyment) as less rational than the consequences of the functional characteristics.

It can be seen from the table that most purchasing reasons were mentioned in connection with question 1. Thus, the repeated 'probing' after purchasing reasons has not had much effect. This agrees with findings which show that consumers consider only a few characteristics when they buy everyday products (Howard & Sheth, 1969).

Comparison of answers to the open and closed questions

In all, 78 (22%) of the 351 interviewed respondents spontaneously mentioned the packaging as a reason for buying the product. The environmental characteristics of the packaging was only mentioned by one respondent. The remaining 273 respondents were asked directly whether the packaging had any influence on their purchasing decisions, to which 101 said yes. The functional characteristics were also clearly dominant here – of the 273 respondents asked, 80 (29%)

mentioned functional characteristics. However, 20 (7%) also mentioned environmental characteristics. The communicative characteristics were mentioned by 28 (10%) respondents.

Of the 179 respondents who either 'spontaneously' (questions 1-4) or when 'prompted' (question 5) said that the packaging had an important influence on their purchasing decision, 81 agreed to participate in an in-depth interview. This left 249 respondents who hadn't mentioned the packaging's environmental consequences, and who would not be participating in the in-depth interview. These respondents were asked directly whether the packaging's environmental characteristics had an influence on their purchasing decisions (question 6). Of these 249, 52 (21%) said yes.

As mentioned in section 3, it is possible that packaging's environmental consequences affect purchasing decisions on more abstract levels. The above result can thus reflect the fact that, when buying food, consumers focus on the more concrete product characteristics. In view of the fact that, prior to question 6, consumers were asked very searchingly about purchasing reasons, the latter result should probably be seen more as a reflection of the social sensitivity of the subject. It cannot be ruled out, therefore, that the 52 respondents primarily said that environmental characteristics have an important influence on their purchasing decisions (question 6) because they thought that the interviewer would regard this as the most acceptable answer.

Concluding remarks

Not surprisingly, the results of the point of purchase study suggest that the packaging is a less important purchasing reason than price and taste. The packaging was not totally unimportant, however. For the four product types, between 16% and 39% of the respondents mentioned the packaging in reply to the open questions on purchasing reasons. When asked explicitly about the importance of packaging for the purchasing decision, 30-71% of respondents replied positively. This primarily concerned the functional characteristics of the packaging, however. Of the 351 respondents in all, only one mentioned the packaging's environmental characteristics as a reason for buying the product in reply to the open questions.

Since the respondents were not chosen at random, the results of the survey are not generalisable in a statistical sense. However, in view of the number of respondents (351) and the aimed at and achieved variation in demographic and socio-graphic variables (Bech-Larsen, 1995), we feel that the results can justifiably be seen as a general indication of the importance of packaging for Danish consumers' purchasing decisions concerning the food products in question. Thus, the finding that the functional characteristics of the packaging have an important influence on the decision to purchase the four types of food product in question, while environmental characteristics have no influence, can be considered to apply to the majority of Danish consumers.

The results are also presumed to apply to food products similar to those surveyed in the point of purchase interviews, ie everyday products with a long shelf life, whose packaging is not used for cooking purposes. In other words, products which are usually 'on the table' at different mealtimes.

Expectations that purchasing behaviour concerning food products is characterised by habit and limited information-searching were confirmed by the fact that many of the interviewed consumers always bought the same product (Bech-Larsen, 1995). This can partly explain why consumers do not seem to give much thought to packaging's environmental consequences in connection with actual purchasing behaviour, even though they seem to on a more abstract level. According to Ronis et al. (1989), in this way habit can prevent consumers' abstract needs and considerations from being reflected in actual purchasing decisions.

6. THE LADDERING SURVEY

The aim of the laddering survey is to study the kind and extent of consumers' associations between specific packaging characteristics, their expected consequences, and consumers' personal values. In other words, to identify means-end structures.

Respondents for the laddering interview were selected from those respondents in the point of purchase study who mentioned packaging as a reason for buying the product. In the laddering survey, 72 consumers were interviewed in their own homes about the packaging of the food product (cheese spread, butter product, or orange juice) they had chosen in connection with the point of purchase study.

The interview guide for the laddering survey consists of three parts: (a) which product characteristics does the respondent use to distinguish between alternative products; (b) how important are these product characteristics for the respondent's preferences compared with the alternatives in question; and (c) respondents' perception of the consequences of the product characteristics, and the personal values which motivate their interest in these characteristics and consequences. The latter is carried out by asking the respondent "why" each important characteristic is important. The answer to this question is followed by yet another "why" question, and so on, until the respondent is unable to give further reasons.

The three parts of the laddering survey are further described below.

(a) The 'triadic sorting' method (Kelly, 1955) is used to uncover the differences between four alternatives to the product types the survey is based on. Each respondent is only interviewed about the product type he chose in connection with the point of purchase study. The four products are marked by the letters A, B, C and D. The respondent is told that the lettering serves to guide the interview. The sorting procedure starts by the respondent being shown all four triple combinations of the product concerned. For each triple combination (ABC, ABD, BDC, ACD), the respondent is asked to judge whether and how one of the products differs from the other two. The interviewer records all the differences mentioned (both packaging characteristics and content characteristics).

(b) The respondent is given a map with a scale of 1-4, representing the evaluations "no", "little", "some", and "big" respectively. The respondent is then asked to evaluate the importance of the packaging differences mentioned in (a) for product preference. At the same time, a check is made to make sure that the interviewer has understood the differences correctly.

(c) The main part of the in-depth interview is carried out using the laddering method. This part of the interview starts by asking the respondent “why” the packaging differences he mentioned are important. The respondent is introduced to the questioning method by starting with one of the content characteristics mentioned in (a). The “why” questions are repeated until the respondent runs out of answers. The respondent is prompted by means of the techniques recommended by Reynolds and Gutman (1988) for use in laddering interviews. If the respondent is unable to answer within a reasonable period (about 10 seconds), the questioning stops. This procedure is repeated for all the packaging characteristics which the respondent judged to have some or big importance for his product preference in (b).

As can be seen from the above, the actual laddering interview is first carried out in the last part of the survey (point c). The questionnaire guide is reproduced in full in Bech-Larsen (1995).

Analysis of the laddering interviews

The result of each interview is the respondent’s idiosyncratic chains of associations. The content analysis of these chains constitutes the first – and most important – stage of the analysis. The content analysis is a condition for quantifying and interpreting the data at the same time. Categorisation is also the most important source of error and subjectivity in data processing. The first stage of the content analysis consists in determining whether to categorise the mentioned concepts as packaging attributes, consequences of these, or as more fundamental values. In the second part of the analysis, the attributes, consequences and values are categorised in approximately homogeneous groups, after which each category is given a name (Bech-Larsen, 1995).

A weakness of the laddering method is that there is no clear definition of the various levels of abstraction (attributes, consequences, and values). In the analysis described below, therefore, we have chosen to define the boundaries ad hoc, though in such a way that they also build on Gutman (1982), who describes the three levels on the basis of their function vis-à-vis the consumer’s behaviour:

Values are the consumer’s existential goals or subjective norms. Values govern the patterns in the consumer’s attitudes and behaviour.

Consequences are expected physiological and psychological implications of the consumer’s purchase, use, or disposal of products.

Attributes are the concrete characteristics of the product which are important for the consumer’s preferences. Attributes exist independently of the consumer’s behaviour.

The content analysis of the 72 laddering interviews resulted in 650 idiosyncratic concepts being registered and categorised. The categorisation was controlled by two independent persons with knowledge of the laddering method and means-end theory, who disagreed with 47 (7%) of the original categorisations. After closer study and discussion, a consensus was finally reached about the categorisation of all the idiosyncratic concepts.

Results of the laddering interviews

Since the results of the laddering studies for orange juice, cheese spread, and butter products are more or less the same as regards associations concerning packaging's functional and environmental characteristics, only the results of the cheese spread survey will be presented here. The results of the orange juice and butter product studies appear in Appendix A and B respectively.

Point a) in the questionnaire guide consisted of a sorting exercise, which was designed to reveal which characteristics respondents used to distinguish between different products. In point b), respondents were asked whether the packaging characteristics mentioned had “no”, “little”, “some”, or “big” importance for product preference. Based on the results of this, an index has been calculated for the importance of each packaging characteristic for product preference. The index represents the average importance of the characteristics for those respondents who have mentioned it. For each characteristic, the number of “no/little” evaluations was multiplied by 0, while the number of “some/big” evaluations was multiplied by 1 and 2 respectively. The index is calculated as the relation between the sum of these multiples and the number of respondents who mentioned the characteristic in question. The index is calculated only for those characteristics mentioned by at least three respondents.

Table 2. Number of respondents indicating none/little, some or big importance of packaging concerning their preferences for cheese spread

<i>Importance</i>	<i>None/ Little</i>	<i>Some</i>	<i>Big</i>	<i>Total</i>	<i>Index</i>
<i>Packaging attributes</i>					
Material (plastic/cardboard)	7	5	5	18*	0.88
Amount	2	2	3	7	1.14
Reuse	3	1	5	9	1.22
Reseal	2	4	11	17	1.53
Preservation	0	2	1	3	1.33
Transport	0	2	0	2	–
Brand mark	4	3	1	8	0.63
Appearance	3	10	15	28	1.43
List of ingredients	1	0	7	8	1.75
Volume	6	0	6	12	1.00
Total	28	29	54	112	–

* 1 unspecified

83 of the 112 packaging characteristics mentioned in the sorting exercise were judged to have some or big importance for product preference (Table 2). This strengthens the indications of the point of purchase study that packaging characteristics influence product preferences for cheese spread. Those respondents

who mentioned the functional characteristics ('sealing' and 'preservation') and communicative characteristics ('appearance' and 'list of ingredients') of the packaging attached great importance to these characteristics. This suggests, like the point of purchase study, that packaging's functional and communicative characteristics are very important for consumers' preference for cheese spread. While the environmental characteristics ('material', 'amount', and 'reuse') were often mentioned, they have less importance for preferences than the functional and communicative characteristics.

Construction of a hierarchical value map for cheese spread packaging

Laddering data are most often aggregated and interpreted by means of so-called 'hierarchical value maps' (HVM) (Reynolds & Gutman, 1988). The results of each laddering interview appears in the form of a series of individual chains of associations, which consist of the idiosyncratic concepts mentioned by each respondent. As stated above, the first stage of the HVM analysis is a categorisation of these concepts. Next, the number of paired direct and indirect associations between the categorised concepts are counted. A 'hierarchical value map' is then constructed on the basis of the most frequently occurring associations, which illustrates respondents' 'shared' perception of the consequences and associated values of the product attributes.

An association is only included in the hierarchical value map if it can meet a minimum frequency requirement (a cut-off criterion). Reynolds and Gutman (1988) recommend setting the cut-off at about 4 per 60 interviews. Since the present analysis is only based on 21, 30 and 21 interviews respectively, it was decided to begin with a cut-off level of 2. This resulted in impractical value maps, however, so a cut-off level of 3 was chosen for all three product types. Thus all associations with at least three direct or indirect connections are included in the map.

The laddering data were analysed using Reynolds and Gengler's (1987) computer program. The program output for each of the three product types consist of an implication matrix and one (or more) hierarchical value map. The implication matrices (Bech-Larsen, 1995) describe the number of direct and indirect associations between those concepts mentioned by respondents in the laddering interview. The hierarchical value map gives a graphic illustration of the concept categories and associations most frequently mentioned by the respondents.

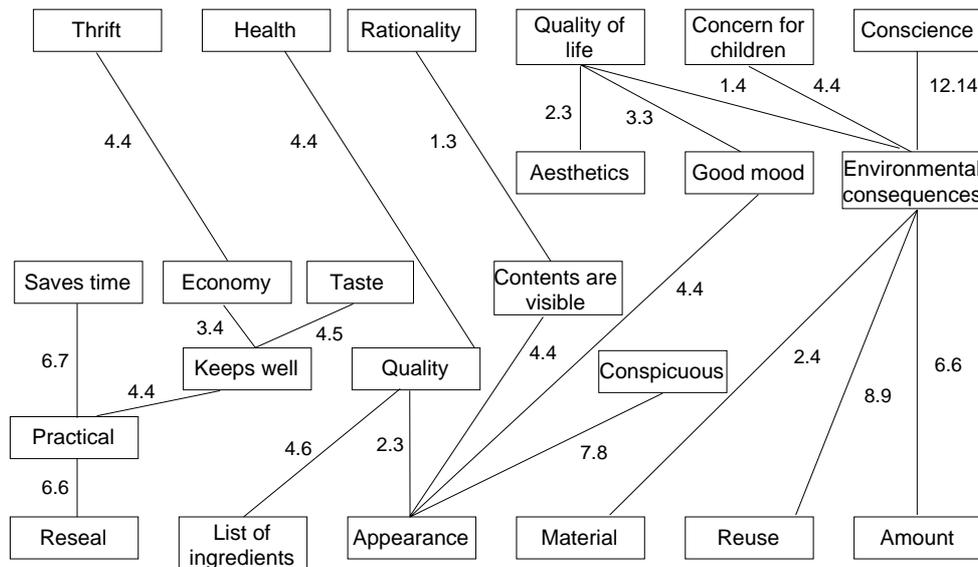
In the hierarchical value map in Figure 4, all the boxes in the top and bottom rows contain values and attributes respectively, while all those in between contain consequences. The number of direct and indirect associations (x,x) are shown for each connection.

Only some, albeit the most important, of the categorised associations are shown in Figure 4. The 22 direct associations included in the hierarchical value map have an average frequency of 4.5, while the 78 direct associations not included have an average frequency of 1.08.

Figure 4 shows that the cheese spread packaging is important to consumers mainly because of three groups of characteristics: communication ('appearance'), function ('sealing'), and disposal ('material', 'amount', and 'reuse'). Com-

paring Table 2 with Figure 4 shows that 'preservation', 'amount', 'symbol', and 'transport' are not included in the figure. 'Amount' and 'symbol' were judged to have 'some' or 'big' importance for product preference by six and four respondents respectively (Table 2), but since respondents had very different associations with regard to these two attributes, they were not included in the figure. Figure 4 also shows that respondents particularly associate functional packaging characteristics with the personal values 'health' and 'quality of life', and that both the environmental and communicative characteristics are associated with the latter.

Figure 4. Hierarchical value map for cheese spread packaging



The frequency of direct and indirect associations for the various connections is shown in Figure 4. This shows that, measured by the number of respondents who associate these characteristics with consequences and values, the environmental characteristics 'material', 'reuse', and 'amount' are the most important. This can be seen as reflecting the fact that, compared with the functional and communicative packaging characteristics, the environmental characteristics of cheese spread packaging are related to the more abstract and personal forms of subjective knowledge. Figure 4 also shows that 14 (47%) respondents associate the packaging's 'environmental consequences' with the value 'conscience'. The survey thus indicates that there is a group of consumers who are interested in the environmental consequences of cheese spread packaging. Due to the selection method used, however, this group probably constitutes less than 47% of all consumers, but apart from this nothing can be said about the size of this group.

Concluding remarks

The studies show that, for all three product types (see Figure 4 and Appendix A2 and B2), the environmental consequences of the packaging gives rise to associations to personal values more often than the other packaging characteristics. Between a third and half of the respondents in the three studies associated the packaging's environmental consequences with their personal values. This indicates that there is a group of consumers who are personally involved in the environmental characteristics of food packaging. The results of the present survey are not sufficient to estimate the size of this group, however.

The results of respondents' explicit evaluations of importance (see Table 2 and Appendix A1 and B1) show that the importance of the packaging's environmental characteristics for product preference is less than the importance of its functional characteristics. The plausibility of this result is strengthened by the results of the point of purchase study for the three product types. On the whole, therefore, the results of the laddering studies must be interpreted as follows: while there is a group of consumers who, on an abstract level, are involved in the packaging's environmental consequences, those consumers who say that environmental characteristics are important for their preference for specific products are few in number.

According to the *Theory of Planned Behaviour* (Ajzen, 1988), a characteristic is only important for consumers' preference to the extent that its consequences are perceived as both appreciable and certain. The large number of associations between personal values and packaging's environmental consequences indicate that many consumers perceive environmental consequences as appreciable. If consumers are uncertain about the environmental consequences of a specific container, however, then these consequences are unlikely to influence product preference. A possible explanation of the modest importance of environmental characteristics for preferences for specific products, therefore, is that respondents are uncertain about the environmental consequences of the various containers. The results of the preliminary study suggest that this is actually the case.

That the means-end chains which start in environmental characteristics are more frequently associated with respondents' basic values than functional characteristics suggests that respondents' involvement with these characteristics is more lasting and general as regards product types and use than their involvement with the functional characteristics. Conversely, the HVM analyses indicate that the packaging's functional characteristics are often related to specific products and uses, and that consumers' concrete knowledge about the functional characteristics is greater than their knowledge about environmental characteristics. This is because the means-end chains which start in the functional characteristics are typically more complex on the consequences level than on the values level (see Figure 4 and Appendix A2 and B2).

All 72 respondents mentioned the products' packaging characteristics when asked to describe the differences between an assortment of products. This is a natural consequence of differences in packaging being much easier to see than differences between the products. Inasmuch as the assortment the respondents were shown consisted of actual products (not empty packaging), however, they also mentioned the characteristics of the contents in the sorting exercise (Bech-Larsen, 1995).

7. THE CONJOINT STUDY

In the laddering study, respondents evaluated the importance of individual packaging characteristics for product preference. Being an absolute evaluation, however, the results said nothing about the importance of the packaging compared with other product characteristics. The aim of the conjoint study is to examine the relative importance of different packaging characteristics and other product characteristics for consumers' preferences for specific food products. In view of the fact that consumers probably find it difficult to distinguish between the environmental consequences of different packaging, respondents were presented with descriptions of a number of 'imaginary' cheese spread products, some of which had a recycling label on the packaging. In addition to this, the design study included four other variables (price, fat content, packaging material, and sealing function).

Based on the above five variables, and using a 'conjoint designer' (Bretton-Clark, 1990), an orthogonal design consisting of 17 different product concepts has been constructed. In the conjoint study, consumers are asked to rank the 17 product concepts according to preference. When this has been done, the respondents' demographic data is recorded and they are asked to evaluate (on a scale of 1-7) the importance of the above-mentioned five variables for their product preference (Bech-Larsen, 1995). The analysis of the conjoint data is based on a decomposition method. This means that the relative utility value of the product characteristics included in the design can be estimated on the basis of respondents' ranking of the 17 product concepts.

Unlike the point of purchase study, the results of which are discussed above, the conjoint study takes a starting point not in actual products and purchasing actions, but in a constructed design. This means a reduction in ecological validity, but there is also the possibility of examining consumers' attitudes to products which aren't on the market yet. The latter is important, because the studies that have been made to date indicate that consumers' lack of ability to distinguish between the environmental characteristics of different packaging can be one of the reasons why they do not include them in their purchasing considerations.

In June, 1993, 604 persons in three supermarkets in Aarhus and three in Copenhagen were approached. Of these, 208 refused to participate, and 231 hadn't bought cheese spread within the past three months. The interviews were carried out in a room near the sales area. A utility function was estimated for each of the 165 interviewees, together with an aggregated utility function for all 165 respondents, based on the 'Conjoint Analyser' program (Bretton-Clark, 1992).

The 17 product concepts were presented to the respondents in the form of illustrated cards, together with a verbal description. Four of the cards are shown in Figure 5 below.

Figure 5. Examples of cards used in the conjoint analysis

Results of the conjoint study

Before the results of the conjoint analysis can be interpreted, it is necessary to check whether respondents have identical preferences for the 17 product concepts. In the case of heterogeneity, it is necessary to estimate additional aggregated utility functions for smaller groups of respondents with reasonably homogeneous preferences.

One way of evaluating respondents' homogeneity is to see whether they differ with regard to which characteristics mean the most for their preferences. According to Bretton-Clark (1990), this can be done by estimating a total function for all respondents and comparing a) the 'Group relative importance' of each of the characteristics for this function with b) an average of the relative importance of the characteristics for each of the 156 respondents' 'Individual relative importance'. However, the fact that b) includes individual variations in respondents' preferences, while they are 'smoothed' in a), means that the total function cannot legitimately be interpreted if the two measures are substantially different (the converse is not necessarily true, however).

Nearly all respondents in the conjoint study were consistent in their ranking. This can be seen from the fact that 156 of the individual utility functions have an adjusted correlation coefficient of more than 0.3. Almost 80% (129) of the individual utility functions have an adjusted correlation coefficient of more than 0.6. Table 3 shows both the 'Group relative importance' and 'Averaged individual relative importance' of the five characteristics. The standard deviation of the latter is shown in brackets.

The relative importance of a variable is calculated as the difference between the highest and lowest utility value for the levels of the variable concerned, divided by the sum of the corresponding difference for all characteristics.

Table 3. 'Group relative importance' and 'Averaged individual relative importance' of the five characteristics

	Fat content %	Price/ DKK	Material	Reuse	Reseal	Total
Averaged individual relative importance %	32 (1.54)	24 (1.20)	22 (1.15)	14 (1.03)	8 (0.58)	100
Group relative importance %	18	38	15	22	7	100

The large differences between 'Group relative importance' and 'Averaged individual relative importance' in four of the five characteristics show that the 156 respondents have heterogeneous preferences. This heterogeneity means that it

makes no sense to interpret the aggregated utility function. Instead, an evaluation of the trade-offs between characteristics must be based on smaller, more homogeneous groups of respondents. Such an analysis is described at the end of this section.

According to Table 3, fat content is the most important variable for the majority of respondents ('Averaged individual relative importance' is highest for this characteristic). The table says nothing about which level of fat content respondents prefer, however. The fact that the 'Averaged individual relative importance' of fat content is considerably higher than the 'Group relative importance' indicates that one or more segments attach a lot of importance to fat content, but also that they have different preferences with regard to the level of fat content. This is confirmed by the results in Table 4, which shows respondents' distribution of preferred levels for the five characteristics.

Table 4. Respondents' distribution of preferred levels

<i>Variable</i>	<i>Distribution of preferences in %</i>			<i>Total</i>
Price	DKK 10 75	DKK 14 17	DKK 18 8	100
Material	Plastic 41	Aluminium 22	Glass 37	100
Reuse	Yes 82	No 18		100
Reseal	Yes 60	No 40		100
Fat content	6% 60	15% 12	30% 28	100

Table 4 shows that, *ceteris paribus*, three quarters of the respondents prefer the cheapest product, and 82% prefer a container which can be reused. With regard to material, 37% of the respondents prefer glass and 40% plastic. Only about 20% prefer aluminium packaging. 40% of respondents seem to prefer a container which cannot be resealed. It is important, however, that the results in Table 4 are seen in connection with the relative importance of the individual characteristics for ranking preferences. Since most of the respondents do not attach much importance to resealing, it is possible that most of them have ignored this variable in ranking the 17 product concepts, and that the above distribution is therefore mainly due to coincidence. The plausibility of this supposition is strengthened by the fact that the respondents are more or less evenly distributed between the two levels for 'reseal'.

However, the fact that respondents do not seem to attach much importance to the functional characteristics 'reseal' conflicts with earlier studies, which show that these characteristics have considerable importance for consumers' preferences for cheese spread. The difference could be due to the fact that respondents in the conjoint study use the various packaging materials as indicators for the functional advantages usually associated with the possibility for resealing. Studies (eg TetraPak, 1986) have thus shown that consumers associate different packaging material with different degrees of functionality.

Below, we examine whether the 82% of respondents who, *ceteris paribus*, prefer to dispose of packaging via recycling containers differ from the other respondents with respect to socio- and demographic characteristics. Since more studies (see above) indicate that consumers consider glass to be more environmentally friendly than other packaging materials, we will also examine whether there is a correlation between material preference and respondents' socio- and demographic characteristics.

A number of studies suggest that environmentally conscious consumers are: well-educated, most often women, and normally younger than average (see, eg, Bjerke, 1991; Grunert & Kristensen, 1992). The aim of the following is to see whether these characteristics apply to the 82% of respondents in the conjoint study who prefer to dispose of packaging via recycling containers (see Table 4).

Green and Carroll (1987) recommend using a multiple correspondence analysis (MCA) for the identification of important consumer characteristics in conjoint analyses. MCA is used to construct perceptual maps on the basis of the relationships described in the tables. The map is constructed on the basis of Pearson's χ^2 test.

Figure 6. MCA for sex, age, education and recycling preferences

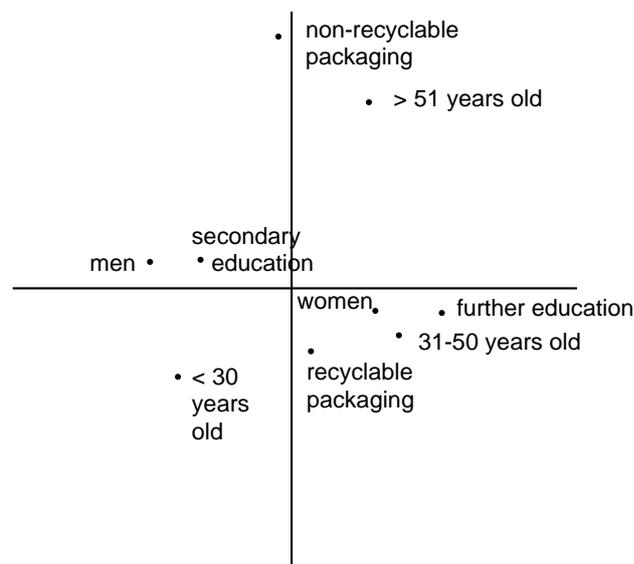


Figure 6 shows that, *ceteris paribus*, recyclable packaging is mostly preferred by women, and that consumers under 50 years of age have a stronger preference for recyclable packaging than older consumers. On the other hand, there does

not seem to be any relationship between educational level and a preference for recyclable packaging.

Segmentation of the respondents

It has been shown that respondents have heterogeneous preferences for both the various characteristics and the levels of these characteristics. It therefore makes no sense to interpret the aggregated utility function for all 156 respondents. Any useful analysis must be based on the possibility for dividing respondents into groups in which preferences are more or less identical.

The attempt to identify such segments is based on a cluster analysis. In the present study, the clustering is based on a calculation of respondents' similarity in ranking the 17 product concepts. Respondents are divided into groups, such that the similarity within and between groups is maximised and minimised respectively. In principle, this procedure can be repeated until the respondents are divided into 156 clusters. Here, however, segmentation stops at six clusters, although a lower number of clusters would make interpretation easier. However, six clusters is the minimum number required to identify a segment which attaches especial importance to the environmental consequences of food packaging.

Table 5. Relative importance of the characteristics for the six segments

Segments:		1	2	3	4	5	6
Number of respondents (n=156)		38	24	29	20	22	23
Material	Ind. aver.	19.68	21.12	9.12	27.95	18.19	15.55
	Group	(21.67)	(26.42)	(13.00)	(28.36)	(30.80)	(17.63)
Resealing	Ind. aver.	10.12	9.71	0.32	0.82	4.72	0.75
	Group	(12.54)	(8.53)	(4.90)	(6.60)	(7.73)	(7.06)
Reuse	Ind. aver.	14.02	12.51	11.24	6.01	10.12	50.13
	Group	(11.23)	(11.10)	(10.09)	(7.31)	(7.99)	(40.34)
Price	Ind. aver.	44.47	15.13	19.02	27.95	39.93	8.39
	Group	(37.22)	(15.30)	(20.16)	(24.23)	(17.75)	(10.72)
Fat %	Ind. aver.	11.71	41.53	60.31	37.27	27.04	25.18
	Group	(17.34)	(38.64)	(51.85)	(33.49)	(25.72)	(24.25)

It can be seen from Table 5 that each of the six segments are reasonably homogeneous with respect to the relative importance of the five characteristics, except respondents in G5, who have heterogeneous preferences for materials and price. It can be seen from the average importance ('Individual relative importance') and associated standard deviations (see Appendix C) of the

recyclability characteristics that G6 attaches significantly more importance to 'reuse' than all the other segments. In view of this, the following analysis will focus solely on G6 (the environment segment).

Utility function for the environment segment

Table 6 illustrates the utility function for G6 (the environment segment). The standard deviation of the estimated utility of individual levels is shown in brackets.

Table 6. Utility function for the environment segment (G6), n=23

Variable	Utility of individual levels		
	Price	DKK 10 0.7 (0.2)	DKK 14 -0.3 (0.1)
Material	Plastic 0.5 (0.3)	Aluminium -1.1 (0.3)	Glass 0.7 (0.3)
Reuse	Yes 3.2 (0.5)	No -3.2 (0.5)	
Reseal	Yes 0.1 (0.2)	No -0.1 (0.2)	
Fat content	6% 1.3 (0.4)	15% 0.3 (0.2)	30% -1.6 (0.4)

Table 6 illustrates the 'reuse segment's' perception of the utility of the individual levels for each of the five characteristics. The table can therefore be used as a basis for analysing the segment's 'trade-offs' between different characteristics. For example, the absolute difference between the utility of a 30% fat content and a 6% fat content is greater than the absolute difference in utility between a price of DKK 10 and a price of DKK 18. Other things being equal, therefore, the respondents in G6 indicate that they are willing to pay at least DKK 8 more for a cheese spread with a low fat content. It should be noted, however, that the social sensitivity of the subject can have an influence on the survey results. Within the price intervals employed in the survey, the environment segment is unaffected by price changes. The utility of the lowest price is significantly higher than that of the other price levels, however.

Surprisingly the reuse segment attaches a lot of importance to plastic and glass packaging. As mentioned previously, a number of studies suggest that, in general, consumers regard glass containers as more environmentally friendly than plastic containers. But the above result can perhaps be interpreted to mean that, in the present study, recycling labelling has made the use of packaging material as an environmental criterion unnecessary. There are some indications, therefore, that environmental labelling can take over the role of packaging material as an 'environmental cue'.

There is a significant difference in age distribution between the G6 respondents and the other respondents (see Appendix D), G6 respondents being generally younger than the others. This agrees with the MCA analysis and previous studies of the relationship between age and environmental awareness (see above). Apart from this, there are no discernible differences between G6 and the other respondents.

In addition to environmental characteristics, the present study also deals with the functional characteristics of packaging. There are indications (see above) that respondents often associate packaging material with functional characteristics. Segment G4 attaches a lot of importance to packaging material (cf. Table 5). Furthermore, a closer analysis of G4 respondents (Bech-Larsen, 1995) shows that they are indifferent to 'reseal' and 'reuse', and that they are very price sensitive. These respondents prefer plastic packaging, and, unlike the other respondents, don't like glass containers at all. This segment's preference for plastic packaging, and their indifference to the recycling variable, suggests that this is a segment for whom the functional characteristics are considerably more important than the environmental – even when the latter are clearly printed on the packaging.

Concluding remarks

As expected, the results of the conjoint study indicated that product characteristics are more important for most consumers' product preferences than packaging characteristics. However, the results also indicate that, *ceteris paribus*, the great majority of consumers prefer recyclable packaging, and that consumers have heterogeneous preferences with respect to packaging material (plastic, glass, or aluminium). With regard to the preference for recyclable packaging, it is important to emphasise that the conjoint method artificially exposes respondents to environmental labelling. This exposure is unlikely to be as strong in an authentic purchasing situation, and any effect on the authentic purchasing decision will therefore presumably depend on the extent to which other means are used. The likelihood of exposure can, for example, be increased by the use of shelf labels, shop signs and other forms of communication at the place of purchase, as well as by information about the labelling scheme in the mass media.

Due to the limited number of variables used (taste is not included, for example), the results of the conjoint study have only limited value for evaluating the importance of the packaging for preferences for cheese spread. But they can be used to evaluate the extent to which differences in the packaging's sustainability and functionality influence the preference for cheese spreads of the same make with identical (apart from the fat content) contents. It should be noted, that neither supermarkets nor respondents were chosen at random.

After the ranking exercise, respondents were asked to state the importance (on a scale of 1-7) each of the five product characteristics had for overall product preference. A comparison (Bech-Larsen, 1995) between the conjoint estimates and the explicit evaluations of importance shows that the two measurements agree with respect to the order of importance of the five characteristics. This is probably because, to the extent they are presented with an actual product and not just individual characteristics, respondents find it easier to take account of trade-offs and thus differences in relative importance.

After the conjoint interview, respondents were asked to choose between four concrete cheese spreads. These products differed with respect to brand, graphic design, fat content and taste, but the packaging was identical and there was no difference in price. Thus, the four products did not differ in four out of the five characteristics included in the conjoint study. However, since the products had different fat contents (6, 15, and 30%), and since the conjoint analysis indicates that fat content has an important influence on preference, it is nevertheless relevant to compare the results of the conjoint analysis with respondents' choice between the four products. Such a comparison (Bech-Larsen, 1995) indicates agreement between the conjoint data and respondents' choice of concrete products.

8. THE GOALS AND TACTICS STUDY

The aim of the goals and tactics study is a) to examine whether consumers perceive a reduction in packaging's environmental consequences as an important goal compared with the need to solve other environmental and social problems, and b) to examine how consumers think the packaging problem should be solved. The analysis of 'tactics' involves both consumers' perception of *who* can and should solve the problem (industry, the authorities, consumers) and *how* consumers themselves think they can help solve it. The data is based on interviews with a randomly selected section of the (Danish) adult population. In all, 222 persons were interviewed by means of CATI (Computer Assisted Telephone Interviewing).¹

As in the previous studies, great care was taken to minimise the effect on the results of the social sensitivity of the environmental debate. The real aim of the goals and tactics interview was therefore concealed from interviewees, and, as mentioned above, the interview started on a very general level, only gradually moving to questions more closely related to specific packaging. Each time the interview moved to a more concrete level, the respondent was first asked an open question. This was then followed by a closed question. The following example from the first part of the interview illustrates the principle:

a) *"In your opinion, which environmental problems are the most important today? Are there other significant environmental problems?"*

b) *"Three environmental problems often mentioned are: Air pollution, the increasing amount of waste, and ground water pollution. Which of these problems do you consider to be the biggest threat to the environment? The next biggest?"*

The analysis described in the following section is mainly based on answers to the closed questions. The answers to the open questions are used to interpret and evaluate the validity of answers to the closed questions. The questionnaire used in the goals and tactics study can be found in Bech-Larsen (1995).

¹ The description of the goals and tactics study is essentially based on the report: 'Emballagens miljøbelastning - En mål-middel analyse af forbrugerens problemopfattelse og løsningsstrategier' (Thøgersen & Bech-Larsen, 1994).

Results of the goals and tactics study

As discussed above, the laddering survey indicates that Danish consumers' concern about packaging's environmental consequences mainly applies to its waste consequences. In this connection, it is obvious to ask next what importance consumers attach to waste problems. Table 7 presents the results of the goals and tactics study relating to consumers' perceptions of the relative seriousness of waste and environmental problems and who they think (industry, public authorities, or households) is mainly responsible for causing waste problems.

Table 7 shows the average ranking together with a letter code signifying whether it differs significantly from the other two possibilities. The lower the value, the higher the average rank. In each case, respondents were asked to rank three problems or problem causes. In order to simplify the exercise so that it could be carried out without the need for visual aids, only three problems or causes were included for each question, irrespective of how many more could have been relevant. The ranking provides information about consumers' perception of the *relative* importance of the environmental/packaging problem. The data do not allow anything to be said about perceptions of *absolute* importance.

*Table 7. Respondents' average ranking of different social and environmental problems, together with who is responsible for the waste problem**

Three topics often mentioned in the media are: Refugees, the environment, and unemployment. In your opinion, which of these 'headlines' describes the biggest problem? The next biggest?	Refugees 2.13a	Unemployment 1.62ab	The environment 2.31b
Three environmental problems often discussed are: Air pollution, increasing volume of waste, and ground water pollution. In your opinion, which of these problems poses the biggest threat to the environment? The next biggest?	Air 1.85a	Waste 2.50ab	Ground water 1.79b
In your opinion, who is most to blame for the waste problem? Is it: industry, the public sector, or households?	Industry 1.59a	Public sector 2.62a	Households 2.06a
Three common types of waste are packaging, food leftovers, and newspapers. In your opinion, which type creates the biggest problems for the environment? The next biggest?	Newspapers 2.42a	Leftovers 2.55b	Packaging 1.22ab

* The values denote the average ranking (ie 1 is highest and 3 lowest). Averages marked with the same letter are significantly different by $p < .05$ (Scheffe F test). Note that the use of analysis of variance presumes that these data can reasonably be interpreted as interval-scaled data.

It can be seen from Table 7 that, in general, environmental problems are considered less serious than unemployment and the refugee problem. The results of the goals and tactics study thus agree with those of the studies referred to in section 3 (eg Madsen et al., 1992). The results also reflect the fact that, at the time of the goals and tactics study (1993), both the media debate and the political agenda were very much preoccupied with unemployment and the refugee question.

The second question in Table 7 shows that both air and ground water pollution are seen as bigger threats to the environment than the increasing volume of waste. This is confirmed both by other studies (Madsen et al., 1992) and by answers to a similar, but open, question asked prior to the second question in Table 7. Here, only 6% of respondents mentioned waste, while 44% and 41% respectively mentioned air and ground water pollution. 13% of respondents were unable to answer the question at all. Respondents' evaluation of the relative seriousness of environmental problems also agrees with the evaluations of both environmental experts and the authorities (cf. the Danish Ministry of the Environment, 1992).

The third question further narrows the focus. Answers to this question show that respondents place the main responsibility for waste problems on industry, then households, and lastly on the authorities. This agrees with answers to a previous open question about which types of waste created the biggest environmental problems: Just under half the respondents mentioned different kinds of household waste, while 70% mentioned waste typically produced by transport, or industrial and energy production. Again, 13% of the respondents were unable to answer the question.

Consumers' conjectures on this question are not completely off the mark. Of the 9 million tons of waste produced annually in Denmark, just under 2 million tons is household waste (in 1985, cf. Danish Environmental Protection Agency et al., 1990). Industry and commerce produce about 2.8 million tons, and electricity generating plants and purification plants about the same. The rest comes from the construction sector. The fact that practically all household waste consists of empty industrial products can influence the placing of responsibility.

The most significant result from this question is that most respondents seem to think that a more environmental conscious consumer behaviour is not the most effective means of reducing waste in general. Consumers think that industry should be the first to change behaviour.

Answers to the last question in Table 7 show how respondents rate the environmental threat from newspapers, food leftovers, and packaging, which together constitute almost 100% of daily refuse (Danish Environmental Protection Agency et al., 1990). Table 7 shows that respondents perceive packaging waste to be a significantly bigger threat to the environment than either of the other two kinds of waste. In answer to a preceding, open question about which types of household waste created the worst environmental problems, 60% of respondents mentioned different kinds of packaging waste, while only 1-3% mentioned newspapers and leftovers.

By weight, packaging waste is by far the smallest of the three kinds of household waste (Danish Environmental Protection Agency, 1990). Packaging constitutes about 30% of daily refuse, while leftovers and newspapers together constitute almost 70%. Apart from returnable drink containers, packaging is the most difficult kind of waste to recycle. All local authorities have collection schemes for newspapers and magazines, and, in many places, also food waste (apart from this, most households recycle their food waste by means of home composting). Except for glass containers, however, there are no collection schemes for the reuse of packaging waste at present. Of those consumers who mentioned packaging waste in reply to the above-mentioned open question, only a few mentioned glass or bottles, while over half mentioned plastic. Thus, there seems to be a connection between the possibilities for recycling and respondents' evaluation of the various types of packaging's environmental consequences.

On the whole, on the basis of Table 7, it can be concluded that most consumers perceive the threat to the environment from packaging waste to be greater than that from the other kinds of household waste. At the same time, however, the results indicate that packaging waste is considered less serious than other environmental and social problems. In view of this, consumers' capacity for dealing with packaging problems can be expected to be limited. The results in Table 7 also clearly indicate that most Danish consumers feel that industry should lead the way in solving the waste problem, followed by the authorities. Furthermore, according to the results in Table 7, consumers do not seem to think that an environmentally aware purchasing behaviour is a practicable way of solving the problem. This is discussed in more detail below.

Consumers' perception of responsibility and competence

Consumers who think that packaging waste is a considerable environmental threat can have different opinions about how best to solve the problem and who should solve it. Table 8 summarises answers to the open questions about what can be done to limit waste problems related to households' total waste production and to the fraction of this which consists of empty packaging. The answers are classified according to who is expected to take chief responsibility for the solution.

Table 8. Who is chiefly responsible for 1) solving the problems caused by household waste, and 2) limiting the environmental problems related to packaging waste? (%)

	Household waste	Packaging waste
Public authorities	39	35
Industry and Commerce	13	43
Consumers	42	16
Others	3	1
Don't know	4	5
Total	100	100

Table 8 shows that, in the case of household waste in general, 42% of respondents say that individual households must take the initiative. When the question focuses specifically on packaging waste, however, the emphasis changes. Thus, 43% of respondents now say that limiting packaging-related problems is mainly industry's responsibility. While the percentage of respondents who mention initiatives from the authorities has fallen, a closer examination of the answers reveals that most of them involve legislative initiatives rather than information.

After the above-mentioned questions, respondents were asked directly what they could do *themselves* to limit packaging-related environmental problems (see Table 9). A massive 85% said that they can do something – half said that they can buy more environmentally friendly products, while a third mentioned more recycling initiatives. In view of the above, what these consumers are probably really saying is that they are *willing* to consider the packaging's environmental impact when they buy products, and to use collection schemes for packaging waste, *if* they are able to distinguish between packaging regarding this characteristic, and if suitable collection schemes exist.

*Table 9. What can you do yourself to limit packaging-related environmental problems? Percentage of respondents**

Buy more environmentally friendly products	49
Separation at source/reuse	36
Influence producers directly	4
Other	6
Nothing	5
Don't know	10
<hr/> Total	<hr/> 110

*Since it is possible to give more than one answer, the percentage of respondents adds up to more than 100.

Only 4% say that they can influence manufacturers directly. This is not very much considering the proportion of respondents that stress the need for initiatives from industry (Table 8) and industry's responsibility for the problem (Table 7).

The conclusion is, therefore, that, while most consumers are willing to do something to reduce household waste, in the specific case of packaging waste most think that industry is mainly to blame for the problem and that initiatives to solve it should come from this quarter. They also think that the authorities have a greater responsibility to solve packaging-related environmental problems than consumers themselves. As regards packaging, therefore, evidence suggests that the inconsistency between attitudes to the environment and purchasing behaviour is partly due to the fact that other solutions than choosing environmentally friendly packaging are considered more practicable. The reason that this doesn't directly result in the choice of collective strategies for consumer influence may be because packaging-related environmental problems are considered relatively small (cf. above).

Perceptions of environmental consequences of specific packaging

We have tried to get a clearer picture of consumers' perceptions of packaging's environmental impact by asking them direct, open questions. In Table 10, we have categorised the answers to questions about product categories at different levels of aggregation.

*Table 10. In your opinion, are there products/food products/cheese spread products whose packaging poses an environmental problem? Percentage of respondents**

	Products	Food products	Cheese spread
No	5	18	20
All packaging	3	1	2
Yes (excess packaging/ not specified)	15	9	10
Materials	32	29	30
Products	48	49	9
Don't know	14	14	33
Total	117	120	104

*Since it is possible to give more than one answer, the percentage of respondents adds up to more than 100.

A comparison between the three columns shows that, the narrower the product group, the more difficult it is for respondents to single out 'environmentally problematic' packaging. Both "no" and "don't know" answers increase drastically when the product category is narrowed from 'products' to 'food products' to 'cheese spread'. Only 1-3% say that *all* packaging is an environmental problem, and this varies little with the level of specification. Also more or less independently of the specification level, about a third of the answers focus on packaging material. A closer analysis of the answers shows that it is mainly plastic which is regarded as source of environmental problems.

Table 10 thus indicates that consumers associate environmental problems more with packaging in general than with more specific product groups and product types. But the results of the more detailed analysis (Thøgersen & Bech-Larsen, 1994) also show that those consumers who associate specific product types with environmental problems are typically concerned about particular aspects of the problem, eg problems with milk cartons. This is less because milk cartons are more environmentally harmful than other types of packaging than a result of intense media and government attention.

All things considered, however, the above suggests that, like the results of the point of purchase interviews and the laddering survey, consumers' concern

about packaging's environmental consequences stem more from the public debate on the subject than their own experience with the disposal of packaging waste. The questions analysed in Tables 7-10 were followed up by a question about how to change cheese spread packaging to make it more environmentally friendly. The answers to this question provide additional material for evaluating consumers' ability to distinguish between the environmental impact of different types of packaging, and it also shows which criteria consumers employ.

*Table 11. Can some cheese spread packaging be changed so that it has a less harmful environmental impact? Percentage**

No	49
Other material, not specified	7
Less packaging	5
Cardbord/Paper instead of plastic	24
Glass instead of plastic	3
Don't know	16
Total	104

*Since it is possible to give more than one answer, the percentage of respondents adds up to more than 100.

Table 11 shows that 2/3 of the respondents are unable to suggest improvements in the environmental characteristics of existing cheese spread packaging. As consumers, therefore, these respondents are also unable to differentiate between the different cheese spreads available with respect to this characteristic. The other 1/3 use the packaging material in particular to distinguish between products. Here, again, plastic in particular is considered to have unacceptable environmental characteristics.

Concluding remarks

An analysis of the relationship between individual consumer's evaluation of the relative seriousness of the packaging problem (compared with newspapers and food waste) and who they think is mainly responsible for solving it (Bech-Larsen, 1995) shows that there is a significant connection. Respondents who are least concerned about the packaging problem are more inclined to think that it should be solved by the authorities than the other respondents. This finding is included in the following discussion of how environmental authorities can influence consumers to include packaging's environmental consequences in their purchasing considerations.

The goals and tactics study shows that only a sixth of Danish consumers think that consumers themselves bear the main responsibility for solving packaging-related problems. Most say it is industry's or the authority's responsibility. When asked directly, however, 85% admit that consumers *can* do something to reduce the environmental impact of packaging. In order to shop in a more environmentally friendly way (as regards packaging), however, consumers must

be able to distinguish between the environmental consequences of different types of packaging. The results of the goals and tactics study indicate that consumers are not yet able to do this. This can explain why, under present circumstances, most consumers are not willing to make a personal effort to alleviate packaging's environmental consequences.

9. IMPLICATIONS OF THE STUDY

Put briefly, the studies carried out indicate that a) many consumers take a personal interest in packaging's environmental consequences (though other environmental problems are considered more serious), and b) this can result in a preference for sustainable packaging, though c) this preference – unlike the preference for functional packaging – seldom influences consumers' actual purchasing decisions. The latter is due to the fact that consumers are unable to distinguish between the environmental consequences of different packaging, that other preferences are more important, and that the purchase of food products is characterised by habit.

The fact that many consumers are personally interested in packaging's environmental consequences suggests that a lot of them can be induced to demand sustainable packaging. Without such a degree of personal involvement, this would undeniably be more difficult. Below, we discuss whether and how this can be done.

According to Rothschild (1979) and Ölander (1992), up to now most public environmental campaigns have focused on influencing specific attitudes and types of behaviour. This is unfortunate, both because it can result in a blurring of the real causes of the problem and because it doesn't encourage consumers to think about alternative strategies (Devine & Hirt, 1989). In view of this, Ölander (1992) – see also Ölander and Thøgersen (1994) – recommends that the authorities should try much more than previously to influence consumers' general environmental attitudes and values. Any change in more general environmental attitudes will require a focus on one or more substantial environmental problems, however. In other words, it is probably impossible to change consumers' general environmental attitudes without highlighting the consequences of one or more concrete environmental problems.

Because packaging waste is more visible than most other environmental problems, it can arguably be used as a catalyst to galvanise consumers into action. However, the results of the various studies carried out here suggest that consumers' concern about packaging's environmental consequences is, like their concern about most other environmental problems (Fietkau, 1984), and despite the high visibility of packaging waste, more a result of the public debate than consumers' own experiences. It is even conceivable that the visibility of specific packaging is one of the reasons why consumers think that packaging waste is less serious than other environmental problems (eg air and water pollution). According to Fietkau (1984), consumers worry more about invisible environmental problems – probably because of their 'hidden' consequences for consumers' health.

Even though packaging's visibility doesn't necessarily strengthen consumers' perception of the seriousness of the problem, and despite the fact that consu-

mers' concern about packaging's environmental consequences is more the result of the public debate than of their own experiences, it should still be possible to use packaging waste as a catalyst to make consumers more active. First, because studies have shown that many consumers are personally involved in packaging-related environmental problems. Second, the fact that most consumers have experience in disposing of empty packaging should make it easier to convince them that every little bit helps. Third, consumers have a tendency to concentrate their efforts on those environmental problems they consider manageable (Ellen et al., 1991), and other studies (Fietkau, 1984) show that consumers think that it is easier to solve packaging-related problems than, for example, air and water pollution.

In view of the last point, it would not be advisable to try to make consumers perceive packaging waste as a more serious environmental problem than air and water pollution. Environmental information should not be based on dire warnings about impending disaster. On the contrary, it should stress consumers' possibility for contributing to the conservation/recreation of environmental qualities (Ellen et al., 1991). At the same time, the authorities should understand that, while consumers are concerned about packaging waste, they do not seem to think that the problem is insurmountable. This probably means that consumers can be motivated to make a personal effort, but it also means that there are limits to the size of the effort they are prepared to make (both in terms of money, time, and the amount of information they can absorb).

The studies carried out have shown that consumers can only distinguish between the environmental consequences of specific packaging to a very small degree. Public information campaigns should therefore contain a certain degree of object- and behaviour-specific information (eg in the form of an environmental labelling scheme). If an environmental label is introduced, however, then it is important to ensure that consumers are made aware of it – both in actual purchasing situations and in those situations where consumers are able to consider the packaging's environmental consequences. This can be done, for example, by means of shelf labelling, shop signs, and other forms of communication at the place of purchase, and by campaigns about the labelling scheme in the mass media. The combined effect of implementing these measures could increase the likelihood of exposure in the purchasing situation.

From a commercial point of view, the development of new food packaging should include a simultaneous improvement in its functional and environmental qualities. Several of the studies indicate that functional packaging characteristics have an important influence on consumers' purchasing decisions, whereas the environmental characteristics do not seem to have any practical importance. But the studies also show that there is a group of consumers with strong preferences for sustainable packaging, so there is probably also a market for this type of packaging. At the same time, packaging manufacturers would be wise to stay one step ahead of expected public regulations in this area. Finally, manufacturers should bear in mind the ever-present risk that a journalist or environmental organisation will get wind of the environmental problems caused by packaging which individual firms/industries produce or use.

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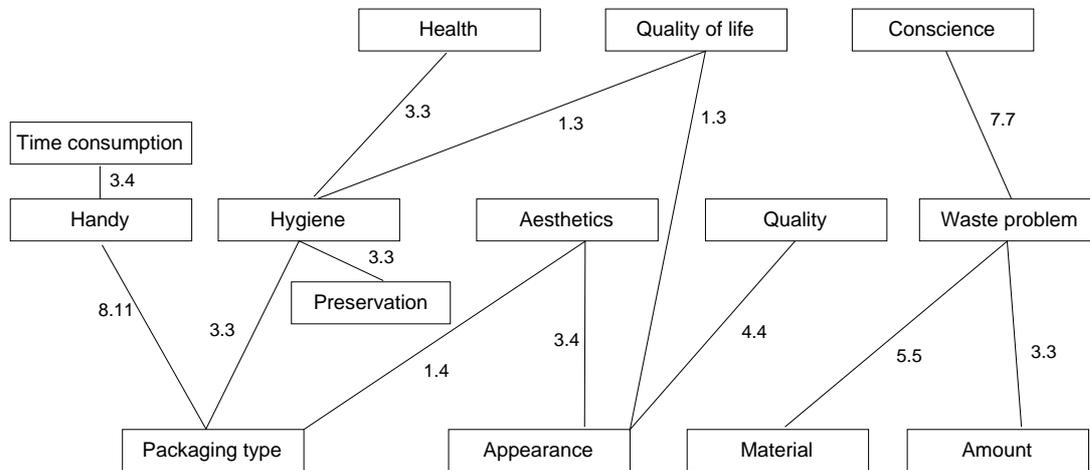
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APPENDIX A1. THE IMPORTANCE OF PACKAGING FOR PREFERENCES FOR BUTTER PRODUCTS

<i>Importance</i>	None/ Little	Some	Big	Total	Index
<i>Characteristic</i>	Number of respondents				
Materials (aluminium/plastic)	3	3	2	8	0.88
Amount	2	0	3	5	1.20
Packaging type (foil/container)	3	4	14	21	1.52
Preservation	0	2	2	4	1.50
Appearance	1	14	1	16	1.00
List of ingredients	0	1	1	2	–
Volume	0	1	0	1	–
Total	8	28	23	59	–

APPENDIX A2. HVM FOR BUTTER PRODUCT PACKAGING

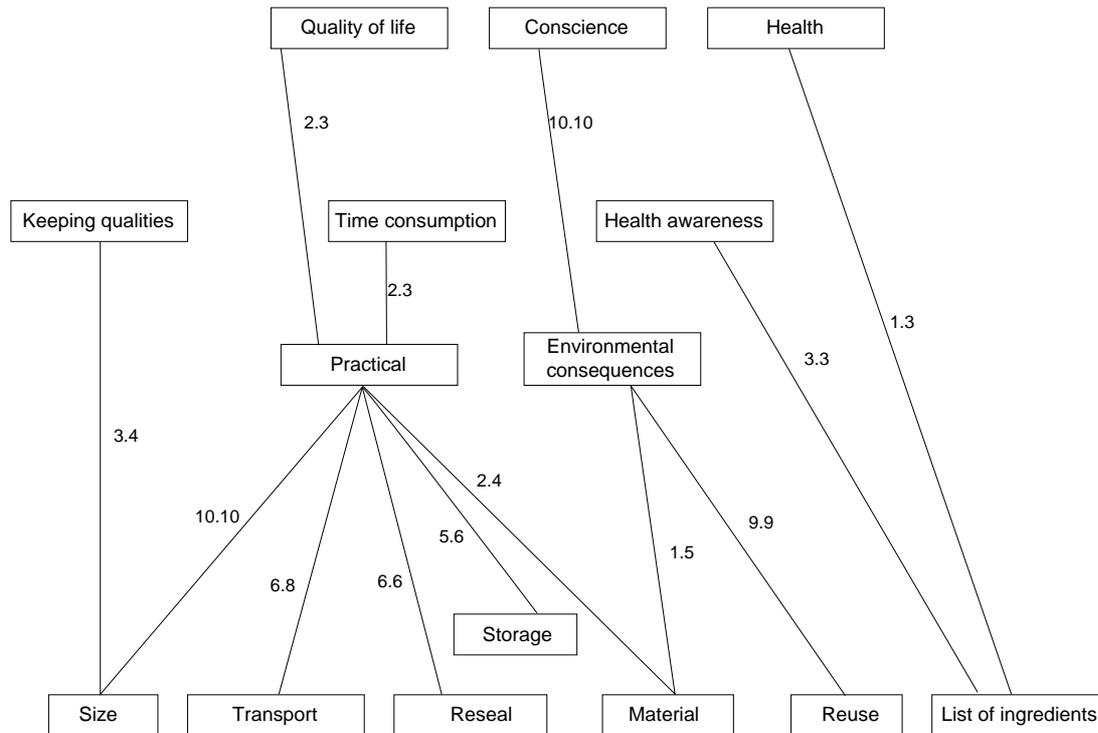


The number of direct and indirect associations (x,x) are shown for each connection.

APPENDIX B1. THE IMPORTANCE OF PACKAGING FOR PREFERENCES FOR ORANGE JUICE

<i>Importance</i>	None/ Little	Some	Big	Total	Index
<i>Packaging characteristics</i>	Number of respondents				
<hr/>					
Materials (glass/cardboard/ plastic)	13	6	2	21	0.48
Volume	2	1	0	3	0.33
Reuse	6	7	5	18	0.95
Reseal	5	8	4	17	0.95
Preservation	8	2	1	11	0.36
Transport	4	1	1	6	0.50
Brand mark	2	0	0	2	–
Appearance	1	2	0	4	0.75
List of ingredients	1	3	4	7	1.43
Size	2	9	3	14	1.07
<hr/>					
Total	44	43	21	108	–

APPENDIX B2. HVM FOR ORANGE JUICE PACKAGING



The number of direct and indirect associations (x,x) are shown for each connection.

APPENDIX C. 95% CONFIDENCE INTERVALS FOR THE RELATIVE IMPORTANCE OF RECYCLING FOR THE SIX SEGMENTS

G1	(n=38)	8.59-----13.87
G2	(n=38)	8.32-----13.88
G3	(n=38)	7.49-----12.73
G4	(n=38)	5.51-----9.11
G5	(n=38)	6.01-----9.97
G6	(n=38)	36.34-----44.34