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CONSUMER PERCEPTIONS ON MODIFIED ATMOSPHERE PACKAGING

by Joan Anderson

Modified Atmosphere Packaging (MAP) could satisfy consumer demands for products with freshness, quality and a longer shelf life. The demand for MAP in the United States could reach 11 billion packages by 1993. The United Kingdom currently leads in this technology, followed by France and West Germany. At present, Canada uses MAP primarily in the food distribution system.

MAP modifies the composition of the natural atmosphere inside a package. The package contains a specific combination of three normal atmospheric gases -- oxygen, carbon dioxide and nitrogen -- that surrounds the food product. The result is an extension of a product's shelf life, without using chemical or physical treatments such as preservatives, freezing, freeze drying and drying. MAP can be used to package a variety of products such as fresh produce, meat and poultry, fish, baked goods, entrées and snack foods.

The Food Development Division, in cooperation with the Federal/Provincial Market Development Council, commissioned a study to investigate MAP's potential in the Canadian marketplace. The study had two components -- one that investigated consumer perceptions of MAP and another that examined the economic benefits to potential investors.

This bulletin gives a brief description of the methodology used for the first (the marketing component) and presents the key findings.

- Methodology
- Main Findings
- Summary

Methodology

For the qualitative phase, the researchers conducted two brainstorming sessions with industry and government representatives to identify possible niches for MAP products and to create ideas and approaches for the study. In-depth personal interviews followed, with male and female consumers of different ages and socioeconomic status.

The quantitative phase consisted of 661 at-home interviews with consumers in Vancouver, Calgary, Edmonton, Toronto, Montreal and Halifax. In every case, the interviewer questioned the main grocery shopper (18 years or older) in the household for about 40 minutes.

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Main Findings

- Current purchase patterns, product life expectancy and waste
- Attitudes towards MAP
- Benefits of MAP
- Purchase intention
- Market projections and opportunities

Current purchase patterns, product life expectancy and waste

The researchers asked the respondents a series of questions about their current shopping habits for 29 food items within the five following categories: vegetables, fruits, baked goods, meat and poultry, and prepared foods. The objective was to determine which food products present good opportunities for MAP in terms of frequency of purchase and the amount consumers throw away because of lost freshness.

Of four vegetables, lettuce was the one consumers bought most often, both in and out of season, followed by broccoli, cauliflower and mushrooms (all in season). They purchased cauliflower least frequently out of season. The respondents usually bought vegetables at the supermarket, followed by fruit and vegetable stores. Overall, they expected lettuce to last the longest (average 6.5 days). Product wastage was high, but varied. Sixty-three percent of the consumers stated they wasted some lettuce, while 33-38% mentioned some waste with the other vegetables.

Of five fruits, respondents bought strawberries most frequently in season. Peaches ranked second. Pears were next in line, while blueberries and raspberries tended to be purchased infrequently -- about half the respondents indicated they do not buy them at all. The consumers usually bought these fruits at the grocery store both in and out of season, although roadside stands and farmers' markets were quite popular for fruits in season. Participants expected no fruit to last longer than one week in the refrigerator. For all types of fruit, 19-25% of consumers indicated that wastage occurs.

Of the five meat and poultry items studied, ground beef ranked as the most frequently purchased, followed by chicken parts. Pork chops came third, followed by deli-style and pre-packaged sliced meats. Most consumers bought meat and poultry from the supermarket. They expected ground beef, chicken parts and pork chops to last from two days to a week, on average. For each of these items, virtually no wastage occurred. Approximately one-third of respondents reported wasting some deli or prepackaged meat slices.

The respondents bought none of the three bakery products studied very frequently. They expected that these items could keep well for a week. Between 16% and 21% reported wasting some baked foods.

Of the three items in the prepared foods category (gourmet entrées, regular entrées and prepackaged sandwiches), the respondents bought none with any significant frequency. In fact, the majority did not purchase these products at all. When they did, they bought these products at a supermarket.

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Attitudes towards MAP

To discover consumer attitudes towards MAP, the researchers first explained the process to the respondents. About 60% had at least one positive comment during their initial reaction, mainly that they thought it was a "good idea". However, over half also had some negative reactions; they were not interested, or they felt such packaging was not needed. About 20% expressed neutral comments, mainly that they would try it first and see what it was like.(Figure 1)

FIGURE 1:
RESPONDENTS' INITIAL SPONTANEOUS REACTION TOWARDS MAP*
(percentage of respondents)

NET POSITIVE	**61**
Good idea	47

	Longer storage	18
POSITIVE	Cost saving	11
	More convenient	9
	Better quality	8
	Helps lifestyle	7
	NET NEGATIVE	**54**
	Not interested	25
	Unnatural	15
NEGATIVE	Higher costs	13
	Don't trust claims	10
	Dislike plastic pkg	7
	Not fresh/nutritious	7
	Inconvenient	6
	NET NEUTRAL	**18**
	Try first and see	8
NEUTRAL	Have questions	6
	Need more info	5

* - 661 respondents

The respondents were asked to agree or disagree with 24 attitude statements about MAP, its potential advantages and disadvantages, and the process itself. The researchers' objective was to investigate underlying attitudes towards food in terms of freshness, quality, shelf life and food packaging. Based on the main attitude differences, three distinct clusters (or market segments) of respondents emerged. These clusters not only differentiated the attitudes directly towards MAP, but exhibited differences in terms of shopping habits and attitudes to technological progress in general. The researchers assigned labels to the consumers in the clusters to reflect their overall characteristics:

Convinced budgeters;
Leaners;
Concerned traditionalists.

Convinced budgeters

This group comprised approximately 36% of the sample. The label "convinced budgeters" stems from their general agreement on the benefits and advantages of MAP, and because they tended to be fairly cost-conscious about their food budget. This group liked the idea of extending the shelf life of fresh food and believed that packaged fresh food is cleaner than unpackaged. They also believed that foods packaged by MAP would save money by reducing food waste, and that the MAP process represents a significant improvement over current packaging techniques. The convenience aspect of the process appealed to these people as they already were buying a lot of convenience foods. At the same time, they liked the prospect of being able to include more fresh food in their diet. Compared to the people in the other two groups, "convinced budgeters" tended to be young (47% were 18-34 years old), somewhat less formally educated (only 8% had completed college or university) and lived in lower income households (almost half had a household income of $30 000 or less). Typically, the household contained three people. "Convinced budgeters" tended to reside in Toronto and Montreal.

Leaners

This group represented about 34% of the sample. As the name implies, they took a middle-of-the-road position. However, they leaned towards the positive rather the negative aspects. They generally did not believe MAP to be particularly different from current packaging, nor did they believe it represented any significant improvement. While they showed some concern about using a special atmosphere to extend the shelf life of fresh products, they

did not believe these gases to be harmful. People in this group tended to be young to middle-aged (62% were 25-44 years old) and fairly well-educated (one in four had attended university or college). Their household income tended towards lower-middle, and their household likely contained three or more people. They were also the most likely market segment to have three household members under 16 years old. "Leaners" tended to reside in Halifax.

Concerned traditionalists

The remaining 30% of the sample earned their title because of their concern over the basic elements of MAP technology (extending shelf life with gases), as well as their perception of possible harmful effects on the environment and themselves. Essentially very negative towards the idea of MAP, this group wanted more information about the process. They also believed that we need less rather than more types of packaging, that current packaging is satisfactory, and that the MAP process would result in unacceptably higher food costs.

Compared to the other groups, "concerned traditionalists" tended to be older, with 40% being 45 or older. They were generally well-educated (about 30% had attended a post-secondary institution), married and living in middle-income households. Although their households contained an average of three people, "concerned traditionalists" were the most likely of the market segments to live in a two-person household. They were also the most likely to have no one under 16 living at home. "Concerned traditionalists" were fairly evenly spread among the cities studied, although they were relatively less likely to live in Montreal.

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Benefits of MAP

The respondents were asked how they perceived the benefits or advantages of MAP compared to the current way in which they purchased food. They believed that MAP would maintain product quality significantly better, enhance freshness and reduce the amount of food wasted. To a lesser degree, they felt that MAP products would reduce preparation time, help them buy just the amount required, make packagingcurrent way in which they purchased food. They believed that MAP would maintain product quality significantly better, enhance freshness and reduce the amount of food wasted. To a lesser degree, they felt that MAP products would reduce preparation time, hel

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TABLE 1 RATING OF MAP VERSUS CURRENT PACKAGING*

	Total	Convinced budgeters	Leaners	Concerned traditionalists
	661	236	224	201
MAP ATTRIBUTES				
Keeping well until ready to eat	79	90	80	62
Freshness	71	86	74	49
Amount of food wasted	71	84	69	54
Preparation time	66	76	63	58
Buying just the amount you want	65	80	65	48
Attractiveness	65	77	65	50
Seeing what you are purchasing	63	76	65	46
Overall quality	62	79	63	36
Texture	58	70	58	41

Need for fridge space	57	69	56	44
Nutritiousness	55	73	54	32
Being good value for money	52	75	53	22

* Scale range is 100 (much better) to 0 (much worse)

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Purchase intention

The next question asked the likelihood of purchasing a specific MAP product in five food categories: vegetables (mixed green salad), fruit (strawberries), baked goods (muffins), meat and poultry (chicken parts), and prepared food (entrées).

The researchers used specific products rather than categories, so that respondents would clearly understand the decision asked of them. The MAP products that generated the greatest purchase intent (about 40% said they would definitely/probably buy them), were chicken parts, strawberries and mixed green salad. Purchase intention was very low for muffins and entrées.

Respondents then saw a card listing the food items they currently bought and were asked whether they would **regularly** buy these products, if available in MAP. Those most popular as MAP products were vegetables and meat and poultry. Fruit and baked goods followed. The respondents expressed very little interest in regular purchases of MAP gourmet or regular entr,es or pre-packaged sandwiches. Of those who said they would buy MAP products regularly, approximately 60% of their purchases would be MAP-packaged within each of the food categories.

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Market projections and opportunities

Marketing researchers understand that what respondents say about their purchase intention for a particular product is not always what they will do. The study applied a new product trial intention model to better estimate what proportion of respondents who said they would buy MAP products would actually do so. This model, called "Impact", was developed in the United States by Market Science Associates from data obtained in hundreds of new product surveys. This model tells us that only 78% of those who say they will "definitely buy" a new product will actually go out and do so even once. Similarly, only 28% of those who say they will "probably buy" will actually try the product, and only 8% of those who state they "may or may not buy" will actually buy it.

When applied to the purchase intention data, the model gave chicken parts, strawberries and mixed green salad each a trial level of approximately 20%. This means that about one-fifth of consumers fully aware of MAP, and presented with the opportunity to purchase such products, would actually buy at least once. Muffins and entrées had a lower purchase intent level (see Table 2).

To project which products represent the greatest potential or best opportunities for MAP, the researchers analyzed the data on both the respondents' current food purchases and their intent to purchase MAP products. The greatest opportunities lie with those products consumers currently purchase most often as well as those they report they would most likely buy on a regular basis, if available in MAP. These products include lettuce, ground beef, chicken parts, strawberries and peaches (in season).

TABLE 2 MARKET PROJECTIONS OF SELECTED MAP PRODUCTS*

Chicken parts	21%
Strawberries	20%
Mixed green salad	20%
Muffins	11%
Entrées	5%

* Figures were obtained by applying a new product launch model called "Impact" to intent to purchase data from total respondents (n = 661)

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Summary

In Canada, the food distribution system is the primary user of MAP technology. As a result, while MAP is relatively well understood by processors and packagers, much of the Canadian public remains unaware of the technology. Unless new opportunities are identified in the consumer market, MAP technology will not reach full potential.

The consumer research conducted in this study suggests that a significant segment of the Canadian population would pay a premium for MAP products. Current trends, such as the demand for more fresh produce, more single-serving products, more prepared meals and fewer preservatives, also support premium pricing for MAP products.

Marketing opportunities for MAP vary from category to category. New product development opportunities exist to exploit the freshness image, the extra shelf life and new prepared foods.

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