



Soups — Canned and Dry

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Industrially-made soups are an established food item in most countries of the world and are particularly well suited to the cold climates and way of life of Western countries. The industry has grown in parallel with the increasing proportion of housewives having employment outside the home and with the expansion of institutional catering. Most domestically-prepared soups need mixing of several ingredients and require the housewife to spend considerable time over a hot stove, while institutions find it increasingly difficult to recruit staff for dreary vegetable preparation.

MARKET SECTORS

Soup products can be divided into two major groups: canned soups and dry soups. Canned soups have a longer history, are generally considered of higher quality and are more expensive, while dry soups offer greater convenience in that they are much lighter to carry in shopping baskets and occupy far less space in the kitchen cupboard and on supermarket shelves. It is also said that the

popularity of dry soups is partly due to the greater personal satisfaction which housewives get from preparing a dish from dry ingredients rather than just opening a tin.

The manufacture of canned soups introduced condensed soups which alleviate the weight problem to some extent, but the manufacturers of dry soups have shown great innovating ability in recent years in improving the quality and shelf life of their products, e.g. by the use of vegetable facts, to the point where they are now perfectly acceptable to everyone except perhaps the most fastidious gourmet. Manufacturers of dry soups have also been able to segment the market further by the introduction of instant soups, which need the addition of boiling water to be immediately ready for consumption, and by the introduction of slimming or calorie-controlled soups, which take advantage of the great weight-consciousness of the modern consumer. Recent market surveys in the West have indicated that some 75% of women and 50% of men are concerned about their body weight.

The proportion of canned to dry soup sales varies from country to country, depending on eating habits, spending patterns and standards of living. The growth of the industry can be illustrated by the fact that in the UK the dry soup market in 1970 was worth £ 10 million, while in 1988 it had reached about £ 100 million. The total soup market is £ 266 million (Table 1).

TABLE 1.
SOUP MARKET SHARES IN THE UK, 1988

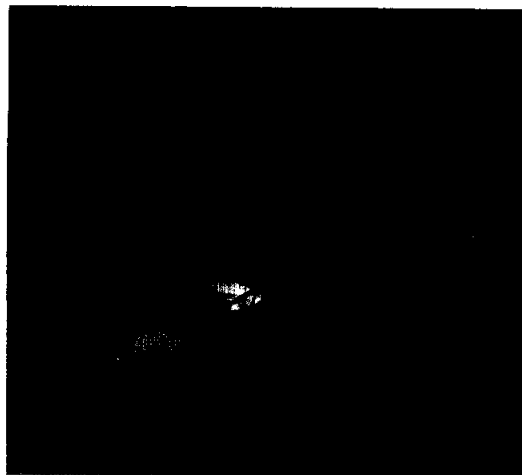
(1) <i>Canned Soups</i> , £ 165 million	
Heinz	60%
Canovekks	6.5%
Baxters	5.1%
(2) <i>Dry Soups</i> , £ 101.4 million	
<i>Instant</i> , £ 52.4 million	
Batchelors	72%
Knorr	11%
<i>Calorie-controlled</i> £ 15.0 million (includes some canned ones)	
Batchelors	54
Heinz	41
<i>Other packet soups</i> £ 34 million	
Batchelors	34%
Own label	25%
Knorr	23%
C & B	10%

Sources: Batchelors/AGB/TCA,
Supermarketing 16 Sept, 1988.

Most dry soups are in coarse powdered form and sold in envelope-like packets, but they are also available as soup cubes and soup sticks or bars.

Technical Aspects

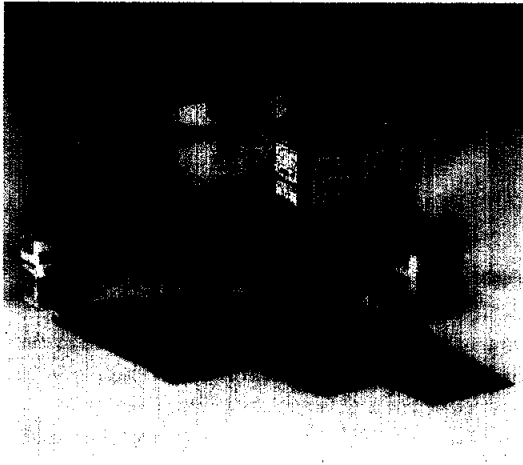
Fat is an essential ingredient of soups and is used even in slimming soups. It contributes to the richness, mouthfeel and nutritional properties of the product and gives a feeling of satisfaction. The minimum fat content in soups is in most countries specified by law, or by a code of practice, and it varies according to the type of soup. Soups described as 'creamed' or 'cream of ...' often have to contain a certain amount of butter.



(1) Canned Soups

The traditional fats used in soups were of animal origin, such as beef tallow and chicken fat, since they possess the flavour of the meat from which they are derived. However these fats lack natural anti-oxidants and their resistance to flavour deterioration is low. Chicken fat in particular is very prone to rancidity, and tallow of good quality and consistent specification is not easy to obtain in most countries of the world.

In the early days of the development of the food industry the above factors were not of major importance, but modern industry — with large scale production and long distribution chains, requires fats of higher quality. Liquid oils of course cannot be used in dry soups because the product will no longer be dry, but even in canned soups they have severe limitations. They tend to float to the top of the can forming an unsightly oily layer; the stable ones like olive, groundnut, cottonseed, etc. are too expensive; and the highly unsaturated ones such as soya and rape, with a linolenic acid content of 6—14%, are very prone to flavour reversion. It is not sufficient appreciated that even partially hydrogenated soyabean or rapeseed oils with a linolenic acid content below 1% are still prone to flavour reversion although accelerated stability tests show misleading good values (1). This is due to the fact that for flavour reversion very little oxidation is required (PV below 1 or 2) while accelerated stability tests such as ADM and Rancimat take the end point at about PV 50—100. The consumer assesses products by flavour, not by PV. For canned (liquid) soups therefore, palm oil has proved by far the most technically superior and popular fat.



(2) Dry Soups

For dry soups the main requirements in respect of the fat are high resistance to oxidation, appropriate consistency and low cost. The quality and physical properties of the fat are even more important than they are in the case of canned (liquid) soups. The fat must possess high resistance to oxidation since it is exposed to a large surface area on the dry particles of the other ingredients. It must have a high solids content to allow the mix to be packed on automatic packing machinery.

For soup cubes in particular, the fat must also be sufficiently hard so that at the time of use the cube can be crumbled between the fingers: a very common fault is for the cube to be plastic rather than friable. It is often assumed that the ambient temperature is 20°C in temperate climates and 25°C in the tropics, but in fact a kitchen, especially around a working cooker, is usually much warmer than that. Under these conditions the solid fat content (SFC) of tallow is not high enough; tallow has to be hydrogenated to a higher melting point than vegetable fats for any given SFC at ambient temperatures and this results in organoleptic disadvantages. Even though most soups are consumed hot, there are limits to the melting point of the fat which the human stomach can tolerate.

The third requirement (low price) is self-evident since dry soups are very cheap products and small differences in price between brands are significant.

The fats used in dry soups normally have melting points above 42°C and at such values

hydrogenated soya and hydrogenated rapeseed oils are sufficiently stable, but because of the extensive hydrogenation required they are usually uncompetitive. The choice in practice is therefore between beef tallow (or hydrogenated beef tallow) and hydrogenated palm oil. Market leaders in the industry have in recent years been turning to the latter. It is all vegetable, very stable to oxidation and is easily available to exact specifications and at competitive prices.

The recommended fats are as follows:-

- (1) For canned soups:

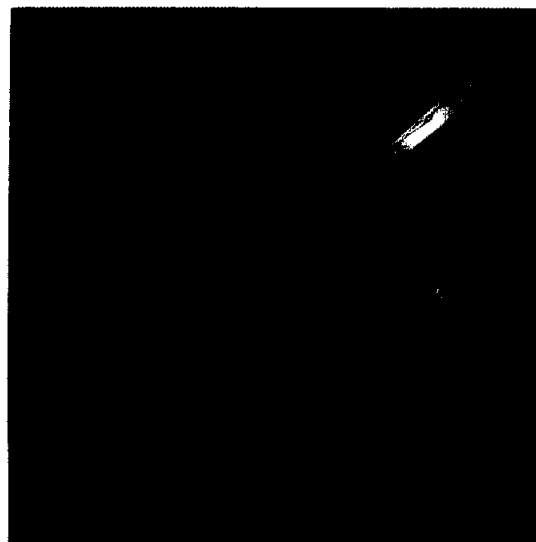
PO (mp 33/38°C)	100%
or Hydrog palm olein (32/34° ... 38/40°C)	100%
- (2) For dry soup mixes:

Hydrog PO (42/44°C) or for warmer climates and soup cubes Hydrog PO (44/46°C)	100%
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Note Hydrogenation of PO for these products should be carried out under highly selective conditions to yield a highly stable fat with a steep solid fat content/temperate profile.

SOUP RECIPES

In the UK 4 soups flavours seem to be clearly preferred and, in the canned food sector at least, account for 65% of all sales. These are tomato, chicken, vegetable and oxtail: two typical recipes are given below, both based on literature sources, but modified by the author.



Canned Tomato Soup (2)

	kg
Tomato pulp	71.5
Water	24.0
Salt	1.0
Palm oil ^a	1.1
Sugar	0.93
Flour	0.51
Chopped onions	0.85
Chopped garlic	0.041
Ground white pepper	0.032
Bay leaves	0.032
Powdered Saigon cinnamon	0.005
	<u>100.000</u>

^a Best include some butter flavour.

PROCEDURE

Place the fat and pulp in a kettle and bring to a boil; then add the onions and garlic and simmer one hour, adding water to make up for loss by evaporation. When the cook is half finished, add the bay leaves, and when within 10 minutes of the finish, add the salt, sugar and pepper; 2 minutes before the time is up add the cinnamon and the flour mixed with water; boil 2 minutes, turn off

steam, run through rotary pulper or shaker, place in cans, seal and process no. 1 cans 30 minutes at 240°F.

MARKETING ASPECTS

(1) **Religious**

A major marketing advantage which vegetable fats have over all animal fats is that they are perfectly acceptable to all religions. While it is widely known that lard is strictly prohibited by the Moslem and Jewish religions, it should not be overlooked that all other animal body fats including beef tallow are also objected to, unless the animals have been slaughtered in the manner specified by these religions. Even in cases where animal fats are available at lower prices, it is uneconomic for food manufacturers to produce, store and distribute two versions of the same product for different sectors of the market.

(2) **Health Aspects and Consumerism**

Palm oil is the preferred substitute for hydrogenated vegetable oils. In the long term, the natural form (chemically unmodified) in which palm oil could be used plus its good nutritional

Chicken Noodle Dry Soup Mix (3)

Ingredients	Kg	Procedure
Seasoning		
Fine flake salt	17.200	Mix the seasoning with 20 kg freeze-dried noodles, yielding 120 kg of soup mix.
Dextrose	17.320	
NSG	12.720	Pack in laminated pocket packs
Gelatinized Duragel starch	11.750	
Standard light yeast	5.440	
HPP (Food grade)	19.040	56 g makes 1 litre of soup 13.3 g makes 1 cup of soup.
Garlic powder	0.480	
Onion powder	0.440	To prepare soup, place the mix in a pan, pour boiling water and mix for 2 minutes.
Hydrog PO 42/44 ^a	2.48	
Chicken soup flavour H 5685 (Bush Boake Allen Ltd UK)	8	
White chicken meat, freeze dried	3.840	
Parsley granules (for garnish)	0.250	
Oleoresin of celery	0.013	
Oleoresin of turmeric	0.015	
Superesin of black pepper	0.011	
Oleoresin of paprika	0.002	
	<u>100.000</u>	

HPP = Hydrolyzed Plant Protein. (Various grades are available, consult manufacturers).

^a Best include some butter flavour. For soup cubes use mp 44/46°C.

attributes, as found through recent nutritional studies, will make it a better choice than other vegetable or hydrogenated vegetable oils for the manufacture of soup.

There is no doubt that the consumer in the Western World is becoming increasingly health conscious and an increasing proportion of modern housewives look for 'vegetable fat' on food labels. Furthermore this group, representing the better educated and more affluent classes of society exercises a continuous influence on the purchasing habits of the other social groups.

REFERENCES

1. MOULTON, K.J., KORITALA, S. and WARNER, K. (1985). *JAOCS* 62: 1698.
2. LOPEZ A. Complete Course in Canning. The Canning Trade Inc., USA.
3. FARRELL K.T. SPICES, Condiments and Seasonings. Avi Publishing Co. Inc., USA.