

Palm Olein Captures the Market for Instant Noodle Frying

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INTRODUCTION

Wrapped instant noodles were first developed in Japan in 1958 followed by cup noodle in 1971. The popularity of this product has grown since and sales grew rapidly as the product can be cooked instantly and preserved well. The product is being produced and consumed in large quantities not only in Japan, but also in many countries which among others include Korea, Taiwan, Hong Kong, America, Malaysia, Singapore, Indonesia and the European countries.

Instant noodles are manufactured in two ways, namely, seasoned noodle and plain noodle with a soup bag. In the early stages, the manufacture of instant noodle was very simple. Chicken soup was mixed into the flour or sprayed onto the noodles which were steamed and oil fried. After 1971, a sachet of soup base was introduced in the package of the instant noodle to improve the taste. Later, an additional sachet of oil base was also included for the non-oil fried instant noodles. The addition of an oil base and a soup base for instant noodles still did not give a complete product. Subsequently, more ingredients such as onion, cabbage, carrot and other vegetables in dehydrated forms were added into the soup base together with freeze dried chicken meat or beef. The latest version of instant noodle products also include a sterilized retort pouch containing vegetables and meat soup base. This gives a better flavour and tastier products.

The development of the instant noodle industries provided a good opportunity for palm oil to project itself as an excellent natural frying medium of vegetable origin. The natural goodness that is conferred to the finished products fried in palm oil renders palm oil as the best deep-frying medium in most countries. Today, palm oil and palm olein both capture a large share of the market for instant noodle worldwide.

INSTANT NOODLE MANUFACTURING PROCESS

As mentioned earlier, instant noodles are manufactured in two ways: namely, seasoned noodle and

plain noodle with a soup bag. The former contains a seasoning liquid while the latter requires a white colour as one of its important characteristics. Wheat flour is the main component of instant noodle along with other additives such as salt, carboxy methyl cellulose (CMC) and alkaline powder which is normally potassium and sodium carbonate mixture (K_2CO_3 and Na_2CO_3). The latter ingredient is the most important additive which gives the noodle the desired stickiness, elasticity, smoothness and good taste.

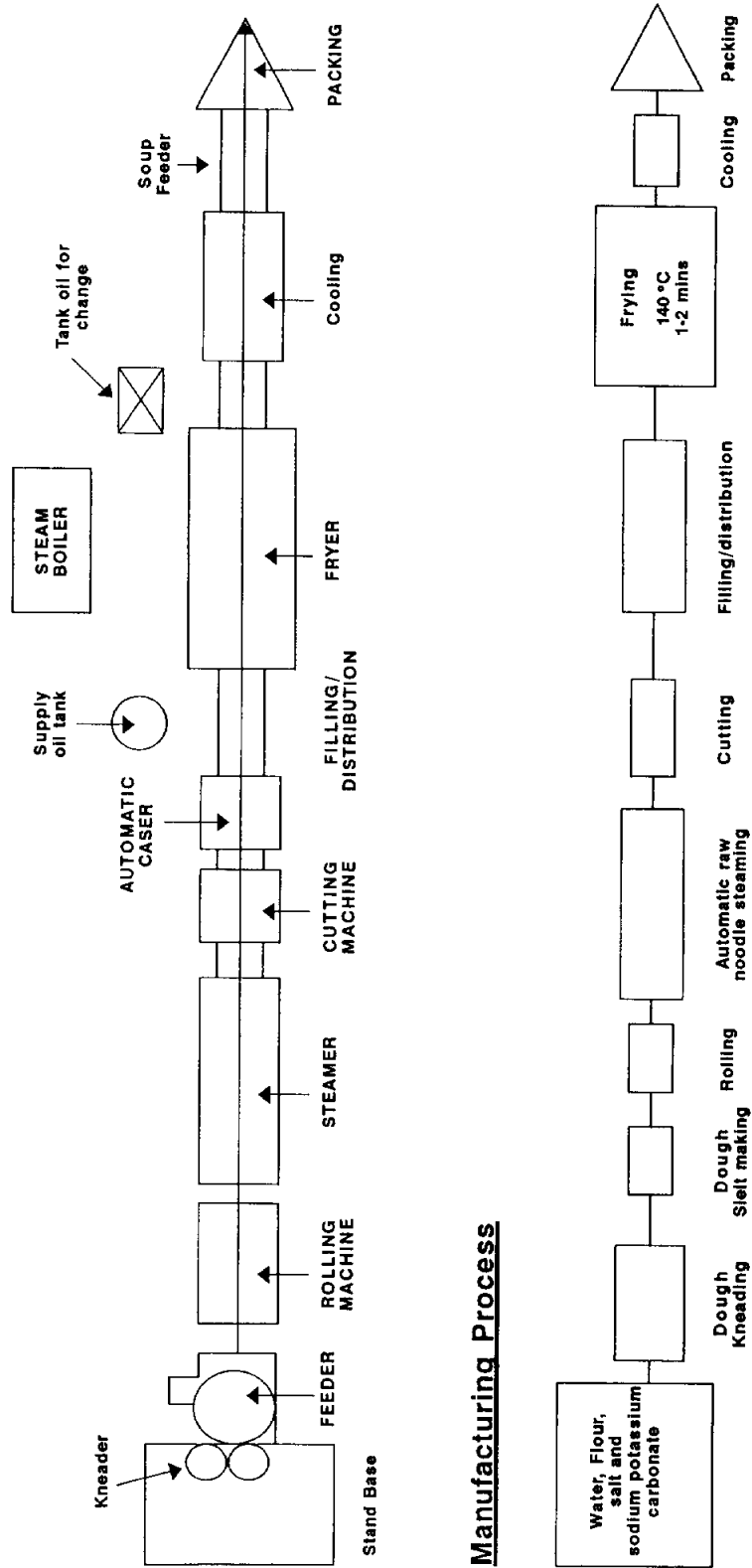
Various manufacturers of instant noodle plants are available and the noodle manufacturing machines today are fully automatic, compact with high speed and effectiveness. While the layout may vary slightly depending on the manufacturers, the principles of basic unit processes are similar. A general arrangement of an instant noodle plant is shown in *Figure 1*.

The various processing steps in the manufacture of instant noodles include:

- Material kneading
- Dough sheet making and strip making
- Steaming and cutting
- Frying
- Cooking
- Inspection/packing

Among the processes, the frying process is one of the most important because it greatly affects the quality and the shelf-life of the end-product. Prior to this process, wheat flour plus additives are well kneaded and the dough is passed through a compound pressing roll machine to make a dough sheet. The sheet is then passed through rollers and gradually pressed to a thickness of 0.8 mm to 1.2 mm. The dough sheet is next cut into 1.4 mm wide strips in the roll cutting section and then the strips are waved. The noodle strips are steamed for approximately 1 minute 20 seconds and then cut into portions by a measuring cutter machine and delivered to the retainer of the frying conveyor.

The noodles supplied to the frying retainer are traditionally fried in tallow or lard but palm oil is now commonly used. The noodles are fried at 140°C



Manufacturing Process

Figure 1. A General Arrangement of An Instant Noodle Plant

for 1 to 2 minutes. Frying serves the following functions:

- i) It reduces the moisture of the product to the level that growth of moulds are prevented.
- ii) It imparts flavour and texture and
- iii) It improves the nutritional content by incorporation of the fat or oil during the frying process.

PALM OIL AND PALM OLEIN AS FRYING MEDIA

Oils or fats are major components in oil-fried type instant noodles. The composition of instant noodles is shown in *Table 1*.

The choice of oils and fats used in instant noodles determines the quality of the finished product. Instant noodles, as consumed in Japan and in other Asian countries, are mostly taken as soup or mixed with vegetable and some spices. Here the taste and flavour contributed by the noodle is very prominent and as such is of major importance to the consumers and producers alike. The stability of the oils/fats used in frying as well as the product stability are critical in determining the quality of the fried instant noodle. Palm oil and palm olein feature extremely well both during the frying operation as

well as during storage of the final product. Compared with other liquid vegetable oils, which have to be hydrogenated to an appreciable degree before they can be used for frying, palm oil does not require such processing. Palm oil and palm olein, with their inherent stability in terms of their fatty acid composition, the presence of natural antioxidants and tocopherols, is ideally suited to meet the stringent requirement of oil-fried instant noodle. The solid fat profile in *Table 2* demonstrates the superiority of palm oil as a natural frying medium.

Palm oil and its fractionated product, palm olein can meet the stringent quality demands of a frying fat. Palm oil and palm olein which do not require hydrogenation render them the natural choice for food processors worldwide not only from an economic point of view but also from a health point of view. This is especially so in the light of the current controversy over the presence of *trans* fatty acids which will be unavoidably produced with hydrogenated liquid vegetable oils.

Initially, the fat used for frying instant noodle in Japan and South Korea was beef tallow. This has now been replaced by palm oil due to its better performance in oxidative stability as compared with other oils. Based on the composition, palm oil and

TABLE 1. COMPOSITION OF SELECTED INSTANT NOODLES

	Oil-fried type		Non-oil fried type		Cup noodle
Moisture (%)	3.5	– 5.9	11.3	– 14.3	3.4
Protein (%)	10.6	– 11.4	11.5	– 12.9	12.8
Oils/fats (%)	19.0	– 20.0	3.0	– 3.9	20.3
Carbohydrates					
Sugar (%)	57.0	– 58.4	62.3	– 65.9	56.7
Fibres (%)	0.3	– 6.7	0.2	– 0.3	0.1
Ash	6.4	– 6.7	6.7	– 7.7	6.7
Calorie/pack (100 g)	422	– 454	345	– 355	455

TABLE 2. SOLID FAT PROFILE OF COMMERCIAL FRYING OILS (USA and Canada)

	Drop Point °C	10°C	20°C	25°C	30°C	35°C
1	41.1	67.2	47.2	41.5	29.5	14.9
2	45.8	50.6	47.2	31.1	24.5	16.5
3	44.3	44.0	29.1	25.9	20.5	12.7
4	44.5	44.9	27.3	23.5	16.1	8.7
5	42.5	50.7	34.2	29.1	19.5	10.4
Soya bean	←		liquid	→		
Hydrogenated						
Soya bean Oil		69.9	46.7	33.2	17.7	8.4
Palm Oil		57.8	26.8	16.1	9.5	6.7

the more liquid fractionated product, palm olein should have good behaviour at high temperatures. This was confirmed by several studies over the years. Von Zeddelman and Wurziger (1973) carried out an investigation on laboratory heating experiments at 180°C without any frying.

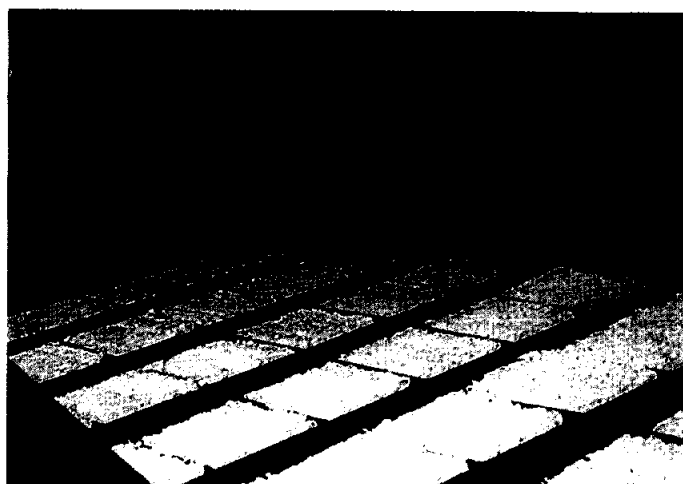
The overall conclusion derived after the authors examined used frying fats from commercial operations was polyene rich vegetable oils should not be generally used for deep frying because of their sensitivity to high temperatures. Hardened (hydrogenated) groundnut oil and palm oil showed greatest stability to high temperatures both in analytical and in organoleptic tests.

Bracco (1981) compared palm olein and groundnut oil in experimental batch fryers. The oil was heated for 100 hours with intermittent frying and the analytical results are shown in *Table 3*.

He concluded that the performance of palm olein is comparable to groundnut oil. These results were confirmed during industrial scale continuous

TABLE 3. ANALYTICAL RESULTS

Oil	FFA (%)	Smoke point	Viscosity CP at 25°C	Polymers %
Groundnut oil	0.42	219°C	113	14.2
Palm olein	0.52	180°C	88	8.0



Processing of Noodle Using Palm Olein

frying operation which showed that FFA development and polymer formation were at acceptable levels.

In some countries, such as Japan, the taste and flavour contributed by the noodle are important and for this reason, some producers use blends of palm oil with other fats such as beef tallow or lard to give a beefy or lard flavour to their products. Some of the oils and fats used for frying instant noodle in Japan is shown in *Table 4*. The profile of flavours obtained by frying can never be simulated by the addition of artificial flavouring compounds. In this respect, palm oil is the dominant choice for frying oil blends in making instant noodle worldwide.



Noodle Products Fried Using Palm Olein

TABLE 4. OILS/FATS USED FOR INSTANT NOODLE FRYING IN JAPAN

Sample No.	Packing	AV	PV	IV	Fatty Acid Composition									Probable Composition
					C14:0	C15:0	C16:0	C16:1	C17:0	C18:0	C18:1	C18:2	C18:3	
1	Plastic bag	0.26	6.59	59.3	1.4	0.2	31.8	2.6	0.2	9.1	44.0	10.2	-	Lard : Palm 50 : 50
2	Plastic bag	0.10	2.02	64.1	1.7	0.2	26.8	3.3	0.3	11.7	44.8	11.1	-	Lard : Palm 85 : 15
3	Plastic bag	0.10	5.19	48.0	1.1	-	44.5	-	-	5.5	41.2	7.6	-	Slightly hydrogenated Palm Oil
4	Plastic bag	0.49	2.39	119.6	0.2	-	13.7	-	-	3.8	26.8	48.9	6.5	Soya bean : Palm 85 : 15
5	Polystyrene cup	0.36	2.14	56.1	1.3	0.1	37.7	1.6	0.2	7.0	41.2	10.8	-	Lard : Palm 30 : 70
6	Polystyrene cup	0.27	2.27	63.0	1.6	0.2	27.3	3.3	0.4	11.0	44.8	10.8	-	Lard : Palm 80 : 20
7	Polystyrene cup	0.55	4.80	50.0	1.1	-	43.5	-	-	5.5	41.0	8.5	-	Palm Oil
8	Polystyrene cup	0.29	4.80	51.8	1.1	-	43.6	-	-	4.9	40.2	9.9	-	Palm Oil

CONCLUSION

The choice of oils and fats for instant noodle frying is of utmost concern by the processors in the light of stiff competition for the market share of the instant noodle industry. In the incessant efforts to search for premium quality oils and fats to produce better quality fried instant noodles, oil and fats which are price competitive and satisfy the frying performance as well as the storage stability of the end products are preferred by the processors. However, in the modern world of consumerism, the discerning consumers will look for a natural product. Palm oil and palm olein seems to satisfy the requirements of both the proces-

sors and consumers alike. Palm oil, which has been endowed by nature with the necessary quality required by the industry, will truly remain as the excellent choice in many years to come.

REFERENCES

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