

NATURFRIE

DEEP FRYING OIL

Developed especially for the frying sector, both for food service and for the pastry sector with the intent and ability to become the reference oil.

The product line has exceeded all our technical controls satisfactorily; therefore, an oil with defined characteristics and contrasts is obtained.

NATURFRIE - DEEP FRYING OIL, bet not only quality but also for health and that its composition is no trans fat (0% trans fat) and minimizing saturated fats also play an important role of oleic acid composition, the omega 3 and omega 9, ensuring a high content of good cholesterol HDL.

TECHNICAL CHARACTERISTICS

Appearance:	Clear, bright, pale yellow liquid oil
Flavor:	Characteristic taste, free from rancid and foreign flavors.
Odor:	Nearly odorless, free from rancid and foreign odors.

Fatty Acids	Composition
Palmitic acid	3 - 6 %
Stearic acid	2 5 %
Oleic acid	60 85 %
Linoleic acid	15 - 25 %
Linoleic acid	2 - 5 %

NUTRITION FACTS

Per 100 g	
Calories	900 kcal 3700 kJ
Protein	0 g
Total Carbohydrate	0 g
Total Fat	100 g
Saturated	10 g
Monounsaturated	72 g
Polyunsaturated	18 g
Cholesterol	0 mg

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ADVANTAGES

- Better performance, more cycles can be used (up to 45 cycles without changes).
- Stable at high temperatures.
- Fry with less smoke and odor-free.
- Fry with less foam.
- Clean and neutral, preserves the original flavor of food.
- Maintains fluidity at low temperatures.
- With **NATURFRIE - DEEP FRYING OIL** results in a crisp and lightly fried food.

RECOMMENDATIONS

- **Frying temperature:**
 Before you start frying, heat the oil to 170 ° C.
 Recommended maximum temperature from 200 to 220 ° C.
 Large pieces between 170 -180 ° C.
- Drain well before frying foods to reduce foam and prevent the rapid deterioration of the oil.
- To reduce the frying time, do not overload the fryer.
- Frozen products: Fry a few units at a time.
- Eliminate fried product particles that may remain inside the fryer.
- Renew all oil to see signs of deterioration (viscosity change, fried dark, odor...).
- Keep the container tightly closed in a cool place, protected from light.

PRESENTATION

10 L, translucent white plastic container and stackable.



NATURFRIE DEEP FRYING OIL

LABORATORY REPORT COMPARATIVE STUDY OF ACCELERATED OXIDATION

A study of accelerated oxidation was performed by the Rancimat method in different types of oil to compare their stability against oxidation:

SAMPLES:

1. SUNFLOWER OIL
2. POMACE OIL
3. HIGH OLEIC SUNFLOWER OIL
4. **NATURFRIE - DEEP FRYING OIL**

METHODOLOGY

Rancimat method, measuring the conductivity of the volatile compounds formed during oxidation.

ISO 6886 (2006) Animal and vegetable fats and oils. Determination of oxidation stability.

Experimental conditions

Amount of sample 2.5 ± 0.01 g

Temperature: $110 \text{ }^\circ\text{C} \pm 0.2 \text{ }^\circ\text{C}$

Gas flow: 20 L / h

Cell: 50 ml of distilled water

Evaluation of conductivity: Induction Time (tangent method)

RESULTS

Table of results

SAMPLE	DESCRIPTION	INDUCTION TIME (Rancimat/hours)
1	SUNFLOWER OIL	5.0
2	POMACE OIL	12.1
3	HIGH OLEIC SUNFLOWER OIL	15.8
4	NATURFRIE DEEP FRYING OIL	20.0



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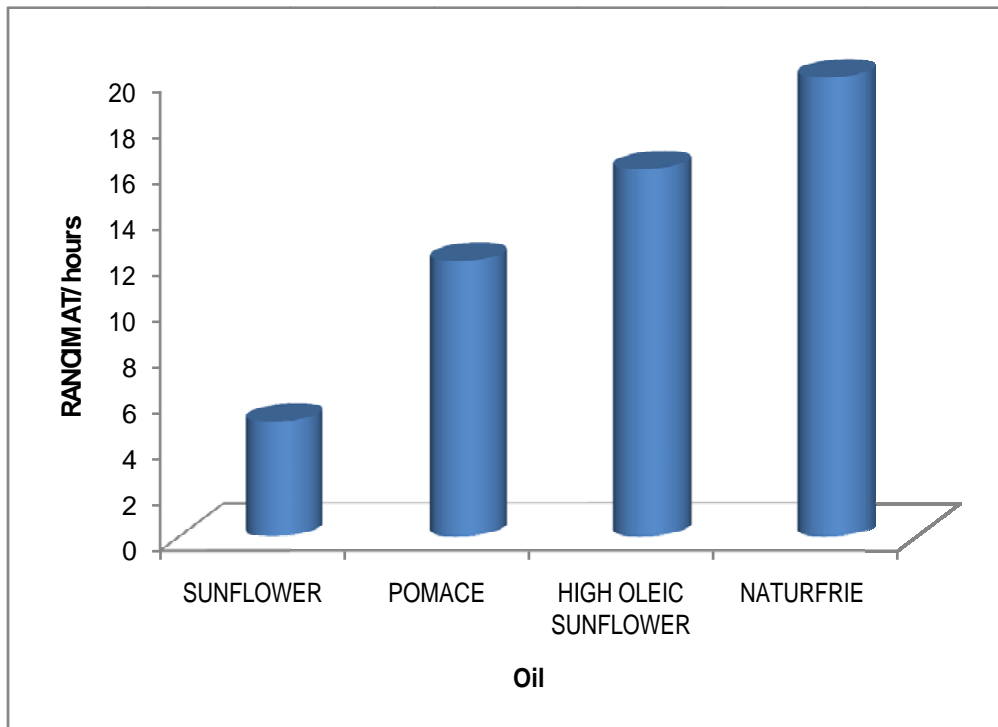


Figure 1. Stability of various oils with respect to NATURFRIE

CONCLUSIONS

NATURFRIE - DEEP FRYING OIL is undoubtedly the best type of oil that acts against oxidation and the most suitable to be used in industrial processes with aggressive treatments or temperatures, as is the case of frying and baking. This feature implies a better conservation of oil, both during thermal processes as in the finished product.

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STABILITY STUDY OF NATURFRIE DEEP FRYING OIL



The following study was conducted to evaluate the state of alteration of the oil when used for frying. In this way, a maximum performance is achieved, but did not reach levels that compromise the quality and safety of fried products.

The fries were conducted in a stainless steel fryer 2.5 L capacity (Orbegozo, FDR-11) by setting the thermostat on the fryer to 180 ° C. The method used was discontinuous frying. Every 5 chips, fresh oil was added to the frying oil in order to compensate for the oil absorbed by the food during frying.

"FRI-TEST" (Merck) was the chosen method to assess the quality of the oil. This qualitative test is sensitive to the concentration of carbonyl compounds (Von Zeddelmann, 1973). Its use is simple, inexpensive and requires no special technical skill. After about 1 minute to blend the color reagent into a tube as indicated by the manufacturer and to establish the quantity of oil to 160-180 ° C, a color appears whose intensity depends on the degree of alteration of the oil. The method discriminates a color scale with 4 levels of disturbance (see Photo 1): Good or a cross (light yellow), still good or two tails (yellow-green), replace or three crosses (orange) and bad or four crosses (brown-orange).



Photo 1. FRI-TEST color scale and results before the first fryng cycle.

The formation of polar compounds (CP) is used as a criterion for estimating the quality of frying oil. By applying the FRI-TEST, described above, it is possible to discard the approach based on the content of carbonyl compounds (polar).

47 cycles were performed before frying oil showed an alteration in this test (see Photo 2 and 3).

Each cycle consisted of heating oil to 180 ° C, adding frozen potatoes, frying for 5



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minutes, removing the chips, and a subsequent spontaneous cooling to 100 ° C. Every 5 cycles, an average of 70 mL of oil is added to compensate for the loss by absorption and / or evaporation. Frozen potatoes were chosen as the frying product, which were obtained in the local market. In each cycle 300 g of potatoes were added.



Photo 2. FRI-TEST color development with life cycles oil service

Every five cycles, an oil sample was taken and subjected to an analytical characterization of its conditions through the following measures: acid value, peroxide value, saponification value, stability (Rancimat) and fatty acid composition. Every 10 cycles the color was also analyzed by the method Gardner.



Photo 3. FRI-TEST color evolution with the cycles. The oil in left is still fit for use. In the right, the oil with 47 cycles where change is recommended but is not yet altered.

Thus, the evolution of these analytical parameters allowed us to establish an objective criterion for the disposal of the oils.

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Figure 2 shows the evolution of the acid value of NATURFRIE. Considering the maximum number of cycles that can be made with oil before disposal. Note that a higher acid value means greater damage by the effect of temperature, as it occurs release of fatty acids from triglycerides forming the various oils, which may favor the formation of smoke and / or off-flavors (hydrolytic rancidity).

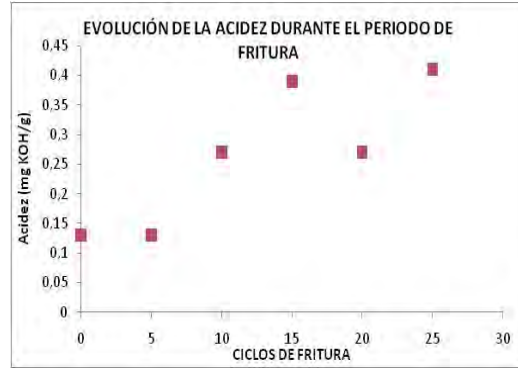


Figure 1. NATURFRIE acid value evolution with frying cycles

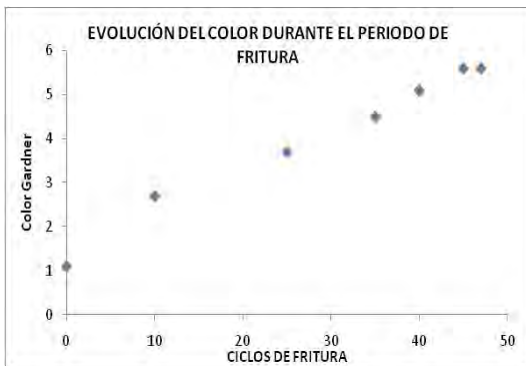


Figure 2. NATURFRIE color evolution with frying cycles

Gardner color measurement is a single parameter that indicates the evolution of the frying oil. The color is getting darker by either thermal effects or the color that potatoes can deliver to it. Greater Gardner color corresponds to a greater degree of deterioration.

The peroxide value of oil indicates the degree of oxidation of an oil. If an oil has a high level of peroxides, it is because it has undergone a process of oxidation, but cannot define to what extent. However, as seen in the plot, the peroxide index evolves according to a parabola and therefore not useful for monitoring oil degradation.

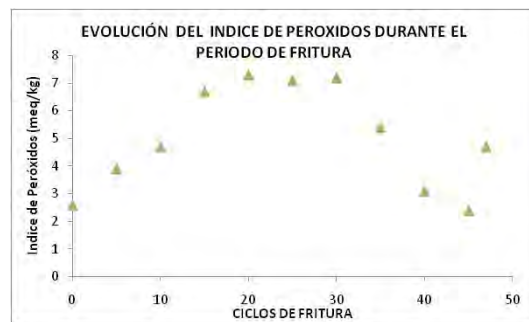


Figure 3. NATURFRIE peroxide value evolution with frying cycles

CONCLUSIONS

NATURFRIE - DEEP FRYING OIL presents the best performance over 47 cycles without having to renew frying with maximum nutritional quality: 0% trans fats and minimal saturated fat