

**BROMATOLOGICAL  
STUDY OF COCONUT  
OLIVE OIL AND OLIVE  
OLIVE WITH CROSS  
LETTUCE (*Lactuca  
sativa*) AND SICILIAN  
LEMON ESSENTIAL OIL**

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**Abstract:** Introduction: Bromatology is the science that studies food, it serves to know the composition of food (physicochemical and organoleptic analysis) and to promote food quality and safety. Objectives: to know the chemical chemistry of olive oil and coconut oil enriched with crisp lettuce and Sicilian lemon; establish the beneficial properties of the ingredients in this food supplement; propose a food supplement with this composition. Methodology: study of bibliographical and experimental research with qualitative-quantitative analysis of bromatological parameters and Enflourage of Aromatherapy. Results: In both flavored oils, coconut oil and olive oil we found benefits to cardiovascular and metabolic health, we ratify the use of flavored olive oil based on the results found by the low content of total fats, low energy value and presence of carbohydrates which in these parameters will be good for the human organism. Conclusion: The choice of flavored olive oil with reduced fat content and the presence of crisp lettuce and lemon essential oil helps to degrade unwanted fat, favors metabolism and improves the absorption of nutrients and the benefits mentioned above, providing improvement in the quality of life and on the consumer's table through this food supplement.

**Keywords:** Olive oil. Bromatology. Integrative and Complementary Practices in Health. Food Security. Food supplement.

## INTRODUCTION

When targeting quality control for food safety, we have the study of Bromatological science to know the properties of foods and favor conditions of plausible information for the composition of an economical and quality diet.

Bromatology is the science that studies food, it serves to know the composition of

food (physicochemical and organoleptic analysis); formulation accuracy; detection of the presence of additives; analysis of the existence of contaminants, toxics, etc., according to VASCONCELOS (2016).

Aiming at chemical quality control, the present research verifies a food supplement with benefits for cardiovascular and coronary health and general well-being (insomnia, weight loss, anxiety, etc.) - olive oil and coconut oil flavored with *Lactuca sativa* (curly lettuce) and Sicilian lemon essential oil, joining the Aromatherapy and Phytotherapy sciences (Integrative and Complementary Health Practices - PICS), (FERRAZ, 2015-2020).

Integrative and Complementary Therapies in Health (PICS) were included in the Unified Health System (SUS) by Ordinance n. 702 in 2018, but since 2006 the ones that already existed were already in our lives. From 2018, Aromatherapy joined Phytotherapy, Floral Therapy, Acupuncture, Ozone Therapy, Apitherapy, Art Therapy and Family Constellations among others with excellent health benefits (BRASIL, 2018).

By highlighting these complementary integrative therapies in health, in particular Aromatherapy studied since 1920, our pillars are the restoration of the following segments: physical, organic, emotional and spirituality/faith to achieve integral health with health promotion, well-being, spiritual connection, and self-care to fight diseases (FERRAZ, 2015-2020).

Aromatherapy is a science that uses essential oils, chemical compounds with therapeutic and/or vibrational action (FERRAZ, 2015-2020), to bring about temperance/balance in the body (research author, 2022). Aromatherapy was created by the French chemist René-Maurice Gattefossé in 1920, he was a specialist in cosmetics (FERRAZ, 2015 - 2020).

In this proposition of knowing the chemical chemical composition of this food supplement we will see if it will be a good commercial product in order to reduce problems of cardiovascular diseases.

As objectives to obtain quality, we have: to know the chemical chemistry of olive oil and coconut oil enriched with crisp lettuce and Sicilian lemon; establish the beneficial properties of the ingredients in this food supplement; propose a food supplement with this composition.

This research is justified by the relevance of a work with an emphasis on nutrition and chemical bromatology in order to detect a food supplement with benefits to cardiovascular and metabolic health.

The experimental study used in this research was the physical-chemical analysis and qualitative-quantitative analysis through bromatology and its methods.

The following themes described in this study were developed: Bromatological Study of Food; Properties and differences of coconut oil and olive oil and Benefits of coconut oil and olive oil enriched with Crespa Lettuce (*Lactuca sativa*) and Sicilian Lemon Essential Oil.

According to the above, they can be lipid food supplements with ingredients approval by ANVISA by RDC n.481 and IN n.87, both 2021, in compliance with the Codex Alimentarius standard and specifications of the University of São Paulo - USP and the Pharmacopeia European Union and called compound oil. Therefore, it is recommended to carry out a bromatological analysis of this compound as a food supplement.

## **THEORETICAL FOUNDATION BROMATOLOGICAL STUDY OF FOOD**

In the study of bromatology, a science that studies food in its nutritional, caloric

and physicochemical aspects, as well as organoleptics (color and odor), additive elements or contaminants / toxics, we can obtain quality control in food intended for the consumer (VASCONCELOS, 2016).

According to Khaw K.T. et. Al (2018) there is growing interest in whether various dietary oils or fats with different profiles may have different metabolic effects.

Also according to VASCONCELOS (2016), the importance of bromatology is inserted in the resolution of public health problems and in putting into practice health surveillance actions. It also establishes the definition of flavoring as a substance or mixture of substances with aromatic properties or capable of creating/reinforcing the aroma and/or flavor of food (VASCONCELOS, 2016).

### **PROPERTIES AND DIFFERENCES BETWEEN COCONUT OIL AND OLIVE OIL**

Olive oils and vegetable oils are important in our diet, there are differences between them due to the presence of fatty acids that facilitate the absorption of vitamins A, D, E, K, but their consumption must not exceed 25% to 30% of the daily diet, that is, 3 tablespoons per day, according to the American Academy of Sciences (GONÇALVES - UNIMED/ Hospital Israelita Albert Einstein, 2019).

Coconut oil – moderate use of this saturated fat is recommended – benefits in the immune system, anti-inflammatory, but some studies claim an increase in HDL (good cholesterol) (GONÇALVES. 2019). It has medium chain fatty acids (MCT) and lauric acid is a component that can raise cholesterol, causing dyslipidemia, according to the Brazilian Society of Cardiology (Santos et al., 2013); Neelakantan, Nithya et al., 2020).

Olive oil – made by cold pressing; the purest, the extra virgin with the lowest acidity (0.5% or less), according to Gonçalves (2019). Because

it is a monounsaturated fat, with oleic acid, polyphenols, vitamin E, dyslipidic molecules with anti-inflammatory and antioxidant action and is part of the Mediterranean diet and has been the protagonist of numerous studies for years, it is the most recommended, according to Marta Guasch-Ferré et al. (2020).

The study by Khaw Kt. et al. (2018), rectifies in a randomized study in 91 individuals (men and women with a usual diet or food supplement with the use of a little more than one and a half spoons than the use of butter (saturated fat) is a greater cardiovascular risk factor than oil coconut (saturated fat) and this is higher than olive oil (monounsaturated fat), in conclusion that olive oil is the best option to reduce cardiovascular risk.

Marta Guasch-Ferré et al. (2020) brings in their research the first cohort study carried out in 1990 as a highlight of the consumption of olive oil included as part of food frequency questionnaires (FFQs), making mention of this food officially on the consumer's table. The protocol was approved by the institutional review board of Brigham and Women's Hospital and the Harvard TH Chan School of Public Health and used as of this date (GUASCH-FERRÉ et al., 2020).

### **BENEFITS OF COCONUT OIL, OLIVE OIL ENRICHED WITH CURLY LETTUCE (*LACTUCA SATIVA*) AND LEMON ESSENTIAL OIL**

This is an unprecedented research with registration of authorship at the National Institute of Industrial Property-INPI in 2021: Umbrella project with research on *Lactuca sativa* (crisp lettuce), (whose highlighted properties are: it has more phosphorus and calcium, rich in vitamins A, C, K, fiber, antioxidants and mineral salts (COSTA, 2020) Each 100g (12 lettuce leaves) contains 15 kcal and has the following benefits: being

soothing, sedative, antacid, anti-rheumatic, eupeptic, laxative, detoxifying, antioxidant, well-being regulator, immunostimulant, lowers cholesterol, prevents anemia and premature aging (In. Dicas de Mulher, 2021; Pessoa, Machado Junior, 2021).

When enriching coconut oil or olive oil, we obtained greater benefits with crisp lettuce in relation to cardiovascular health; reduction of blood pressure and metabolic properties (slimming, better digestion, immunostimulant, eupeptic detoxification, etc.) (Pessoa, Machado Junior, 2021).

When enriching coconut oil or olive oil, in addition to lettuce and the benefits described above, the ingredient lemon essential oil (monoterpene) will play an antagonistic role in the degradation of undesirable fat, favoring the human organism itself in this matter, reducing the risk of accumulated fat and has some properties that enhance the affinity and intrinsic activity of crisp lettuce (Richards, 2015). And lemon essential oil has excellent performance in the nervous system, according to André Ferraz (2020) and (DAMIAN, 2018).

According to RDC no. 481 of 2021, oils added from spices are now classified as compound oils, that is, ingredients added to vegetable oil or fat, or to their mixture, will not de-characterize the product with vegetable oil or fat, as it must continue with the following characteristics: glycerides with fatty acids, with liquid, yellowish and translucent aspects. A caveat is made that depending on the amount of ingredients with the change in these characteristics, the product will become a sauce (ANVISA – GGALI, 2022).

However, vegetable oils or fats - continue with the composition of oils with fatty acids included in IN n.87 of 2021, after updating the regulation, as they are the same requirements of the Codex Alimentarius - FAO/WHO (ANVISA - GGALI, 2022).

## METHODOLOGY

This is a study of bibliographical and experimental research with qualitative-quantitative analysis, since it analyzes physical-chemical samples of the two oils flavored in the laboratory in their bromatological parameters, including the aspects of color and odor.

The bibliographic research was carried out by analyzing scientific articles and books from 2013 to 2022 in the bases of academic virtual bookstores (SciELO, Google academic, Pumbed, Virtual Health Library - BVS, Ebooks, etc.). The experimental research was carried out in the Food and Water Analysis laboratory of a Federal University in Brazil, Maranhão - São Luís in the Food and Water Control and Quality Program - PCQA by the Bromatology method for 2 months in the period November/2021 to January/2022, a method that serves to know the composition of foods, precision of formulations, detection of the presence of additives and analysis of the existence of contaminants, according to Vasconcelos (2016). The sample was produced and transported to the laboratory by the researcher, with 2 samples of 30 mL each; compared the bromatological analysis of flavored olive oil<sub>1</sub>; coconut oil, crisp lettuce (*Lactuca sativa*) and Sicilian lemon essential oil and flavored olive oil, olive oil, crisp lettuce (*Lactuca sativa*) and Sicilian lemon essential oil.

To obtain the flavored oil, the technique of **Enfleurage** (aromatization) letting the ingredients rest to cure the herb, with lettuce added every 2 days for a total of 16 days. The sample was only sent to the laboratory after 2 (two) weeks. First, it was observed, every 2 days of the first two cycles, 4 cups of macerated lettuce were used, in the other cycles 2 cups of macerated lettuce until cured for 16 days). It must be kept in an amber bottle to preserve the flavoring properties

and for about 1 year, according to Amber Richards (2015).

In the present study the following methods of Bromatology were used: quantify the humidity using the oven for 24 hours; quantify minerals (sodium) by incineration; protein analysis by the Kjeldahl method; carbohydrate analysis (due to the final difference from the other analyses); analysis of lipids by gas chromatography and fiber was not verified because the value of fiber in curly lettuce is known (VASCONCELOS, 2016; FARMAJUNIOR, 2022).

## RESULTS

Due to the importance of chemical analysis of a food to determine and know the chemical composition and its benefits, we have below:

It was observed as results the **TABLE I** and the **TABLE II** – Bromatological parameters of flavored oils: **olive oil 1** – coconut oil and **olive oil 2** – olive oil, both with crisp lettuce and lemon essential oil.

Parameters Analyzed	Results obtained
Kcal energy value	586,98
Carbohydrates (g)	_____
Proteins (g)	_____
Total fats (g)	65,22
Sodium (g)	_____
Moisture (g)	34,20
Total minerals (g)	0,58
Color	Characteristic
Odor	Characteristic

Physicochemical analysis of olive oil (composite oil - oil with spices) - RDC n. 481 of 2021.

**TABLE I** - Bromatological parameters of the flavored olive oil sample1: coconut oil; curly lettuce (*Lactuca sativa*) and Sicilian lemon essential oil (compound oil – oil with spices).

**Source:** author's research, 2022

In flavored coconut oil 1, the energy value of 586.98 kcal and total fat 65.22g were highlighted, without carbohydrates and total minerals of 0.58g, moisture of 34.20g. Characteristic color and odor.

It is known that nutritional energy needs are directly correlated with food consumption and this with the energy expenditure by the body for the balance of vital functions and daily activities (VASCONCELOS, 2016). According to Portal Educação (2020), vitamins, minerals and water do not provide energy, but if the person exaggerates in food consumption and does not spend energy through physical activity, he will have fat accumulation manifested in weight gain, obesity and the affirms that the an average of 2,000 Kcal will be sufficient for the individual's needs, and this value may be a little higher for the male group.

Parameters Analyzed	Results Obtained
Energetic value kcl	289,57
Carbohydrates (g)	67,6
Proteins (g)	0
Total fats (g)	2,13
Sodium (g)	0
Unit (g)	29,8
Total minerals (g)	0,47
Color	Characteristic
Odor	Characteristic

Physicochemical analysis of olive oil (composite oil - oil with spices) - RDC n. 481 of 2021.

**TABLE II** - Bromatological parameters of the flavored olive oil sample 2: olive oil; curly lettuce (*Lactuca sativa*) and Sicilian lemon essential oil (compound oil – olive oil with spices).

**Source:** author's research, 2022.

In flavored olive oil, the energy value of 289.57 Kcal and total fat of 2.13g, carbohydrates 67.68, total minerals equal to 0.47g, moisture of 29.8g stood out. Characteristic color and odor.

It is observed that even getting carbohydrates in this composition, lettuce is an ingredient that regulates blood sugar because it has fiber equal to 0.53g in 1 cup (VASCONCELOS, 2016) and 96% of water in its composition and prevents heart disease and cancers, according to Santos (2020) from the World of Education UOL/ Curiosities. And the total energy value was 289.57 Kcal, below the flavored coconut oil, as well as the total fat value due to coconut oil having medium chain fatty acids (MCT) and lauric acids according to the Brazilian Society of Cardiology (Santos et al., 2013).

When comparing the two samples, it was found that the flavored olive oil has carbohydrates, but that its energy value of 289.57 Kcal is lower than the energy value of the flavored coconut oil, which was equal to 586.98 Kcal; as well as the total fat value, since in flavored coconut oil the value found was 65.22g and in flavored olive oil it was 2.13g. We ratify the use of flavored olive oil based on the results found by the low total fat content, low energy value and presence of carbohydrates that in these parameters will do good to the human organism.

It is estimated that nutritional energy needs vary according to age, sex, health status, physiological state, activity level and number of hours worked and that an average of 2,000 Kcal is indicated for the needs of the individual who has his energy intake. from the metabolism of various nutrients: proteins, carbohydrates, fats, alcohol and fibers according to Portal Educação (2020).

Moisture is also highlighted in lettuce and olive oil; with 34.20g of unit in flavored coconut oil and 29.8g of moisture in flavored olive oil.

Lettuce contains 96% of water in its composition, according to Santos (2020) from Mundo da Educação UOL, when being part of the flavored oil composition, its moisture was higher in flavored coconut oil.

In both flavored oils, coconut oil and olive oil, we found benefits to cardiovascular and metabolic health (Khaw K. T et. at.; 2018).

A caveat is made in the consumption of calcium to avoid the formation of kidney stones by the oxalic acid present in lettuce if consumed in excess (MANOEL, 1996 In Sá, 2018).

## CONCLUSION

It is recommended to carry out a bromatological analysis before balancing a food, since this science plays an important role in evaluating the quality and safety of food.

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