

FOCUS on AVOCADO OIL




























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Worldwide production > 5,5 Mln Tons

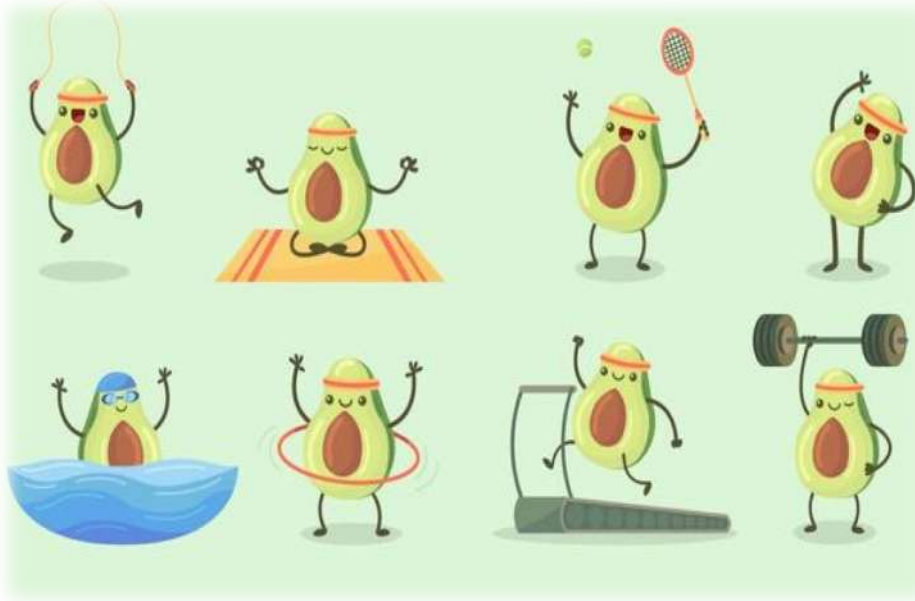
	Nazione	Produzione (tonnellate)	Produzione per persona (kg)	Acreage (Ettare)	Resa (Kg / Ettare)
	Messico	1.889.354	15.147	180.536	10.465,2
	Repubblica Dominicana	601.349	58.576	13.375	44.960,7
	Perù	455.394	14.578	37.871	12.024,8
	Colombia	309.431	6.197	35.114	8.812,2
	Indonesia	304.938	1.151	23.957	12.728,5
	Brasile	195.492	0.933	10.855	18.009,4
	Kenya	176.045	3.455	10.305	17.083,5
	Stati Uniti d'America	172.630	0.527	23.241	7.427,8
	Cile	137.365	7.816	29.933	4.589,1
	Cina	122.942	0.088	20.065	6.127,1
	Guatemala	122.184	7.052	11.602	10.531,6
	Israele	101.500	11.394	8.180	12.408,3
	Haiti	93.201	8.387	15.767	5.911,3
	Venezuela	90.196	2.834	7.990	11.288,6
	Spagna	88.011	1.886	11.159	7.887,1
	Sudafrica	86.468	1.498	16.584	5.213,8
	Camerun	69.794	2.933	16.672	4.186,3
	Australia	67.600	2.699	14.161	4.773,7
	Repubblica Democratica del Congo	65.459	0.805	9.140	7.161,9
	Etiopia	64.982	0.604	17.835	3.643,5
	Marocco	42.256	1.215	3.806	11.101,3
	Costa d'Avorio	36.462	1.454	5.071	7.190,1
	Repubblica Centrafricana	30.126	6.359	1.211	24.886,3
	Nuova Zelanda	27.003	5,51	4.577	5.899,2
	Madagascar	26.433	1.006	3.266	8.092,3



Manual harvest of the fruit



EVERY AVOCADO DESERVES A CHANCE



- Fruit «waste» which can't be sold on local/international market (aesthetic or ripeness problem)
- Good shelf life of the oil (up to 6 months, if well kept)
- Fair value on international markets
- Oil represents a valid alternative to fresh fruit and easier to manage
- With Corona-virus pandemic logistic became more complicated and slower

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Constantly growing Demand

- Avocado oil global market value increased more than 80 Mln USD, reaching more than 500 Mln USD value in 2020
- New Avocado groves worldwide (mostly near Equator line)



- The growing awareness of the nutritional and health values of avocado strongly pushes the demand
- The soft and delicate flavor makes avocado oil very popular

AMENDUNI for AVOCADO OIL



AMENDUNI's experience in Avocado Oil

- Our experience into this sector started more than 15 years ago, all started in Mexico, the motherland of avocado.
- Amenduni's technical support covers mill's design up to installation and post-sales service worldwide, during harvest seasons.
- Nowadays Amenduni is the company with most experience in avocado oil extraction process.
- Extraction lines with our technology are more than 60, with different capacities, for «crude» and «extra virgin» extraction.
- Some of our references are located in Mexico, USA, Perù, Colombia, Kenya, Etiopia, etc.

Example of Avocado Oil Extraction Lines



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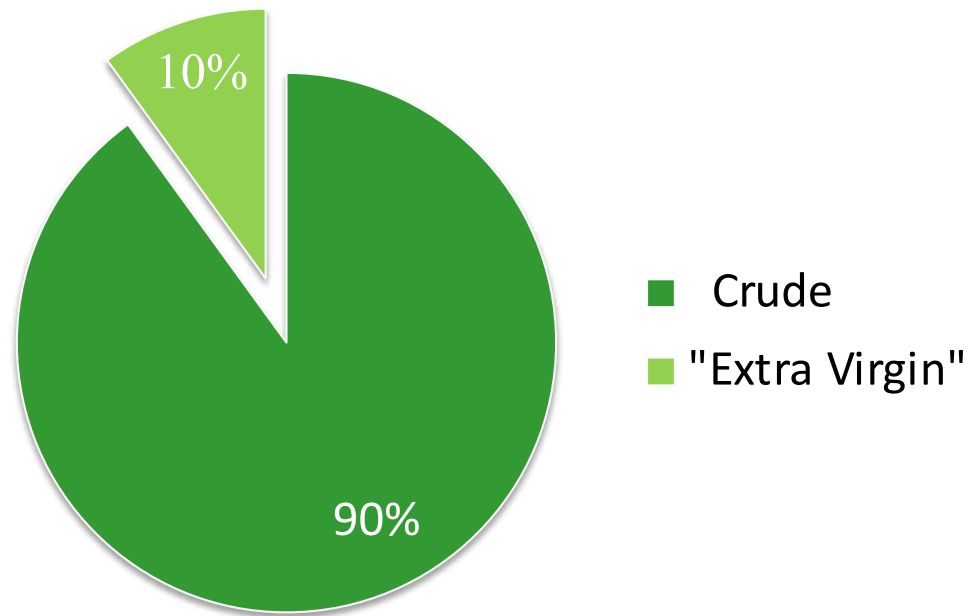
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«Crude» and «Extra Virgin» Avocado Oil

- Usually, the avocado used for the production of oil is the waste of the harvested fruit, which cannot be sold as fresh fruit on local/international markets.
- The type and quality of the fruit used obviously affects the quality (flavor and acidity) of the avocado oil produced.
- Based on experience, “crude” avocado oil is produced using the latest fruit quality (very ripe avocado, with aesthetic defects, etc.), while “extra virgin” avocado oil is produced using the second/third quality of fruit (fruit not very ripe, with aesthetic defects, etc.).
- Both extraction processes begin after a controlled ripening (at environment temperature or in cold storage) of the fruit at constant temperatures.

Olio «Crudo (Grezzo)» ed «Extra Vergine»

World Production of Avocado oil

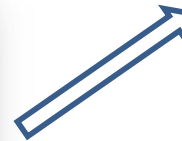
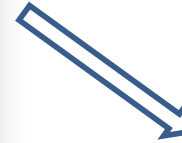


- Bulk price of crude avocado oil \approx **5-5,5 USD/Kg.**
- «Extra virgin» avocado oil has no bulk price, it's bottles in 0,25L or 0,5L.
- A likely bulk price of «extra virgin» avocado oil would be around **10-11 USD/kg.**

FLOW CHART



EXTRA



CRUDE



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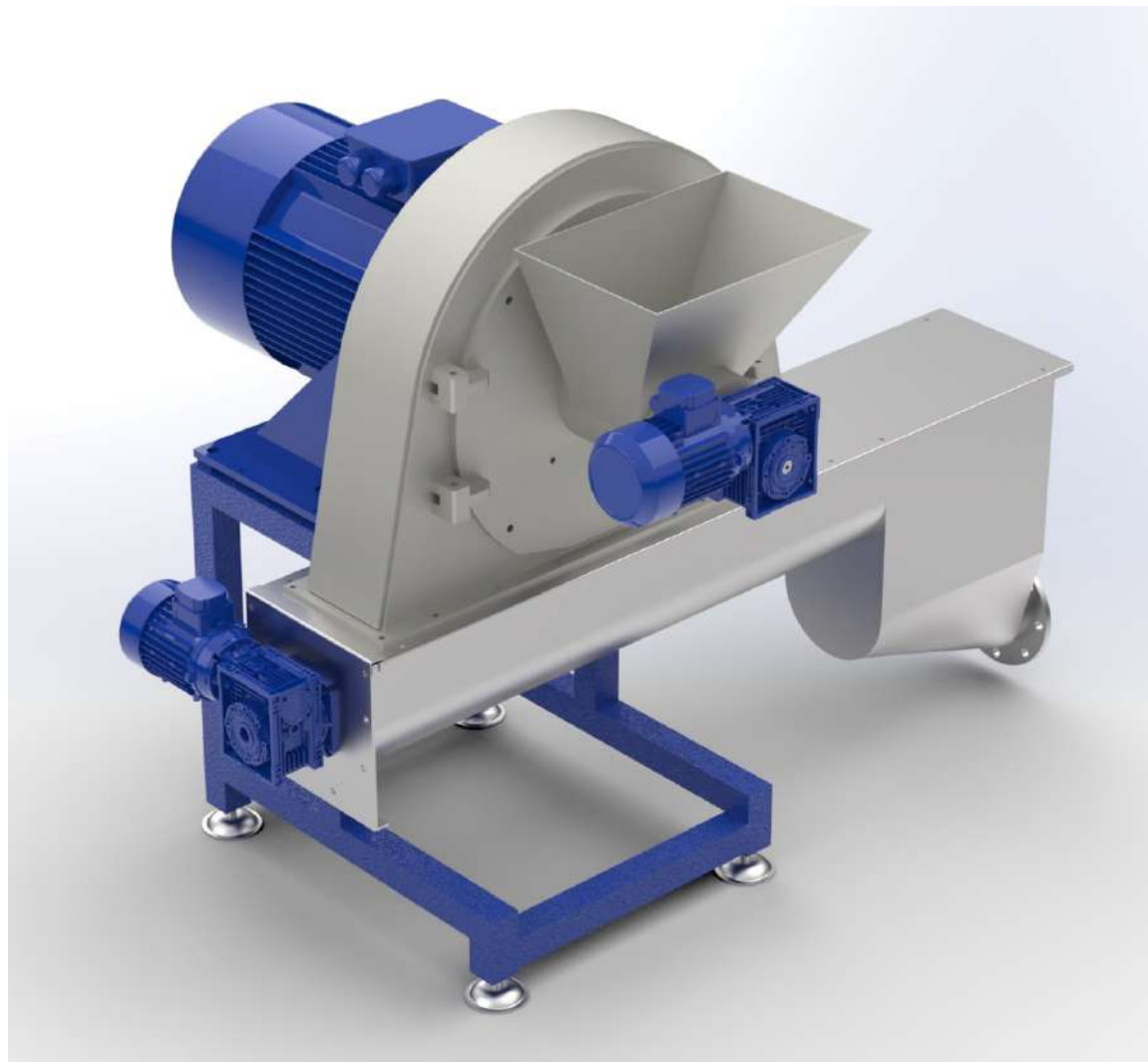
DEPULPER/DESTONER



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CRUSHER



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HEAT EXCHANGER



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- The **Crusher** is used to process the whole fruit, with skin and pit.
- The avocados used in this process are the waste of the recollection (e.g. avocado fallen to the ground, mature avocados, dented avocados, avocados that don't reach the size or are not aesthetically good enough to be sold as fresh fruit on local and international markets).
- The **destoner** is used to separate the pulp of the avocado from the rest of the fruit.
- The quality of avocados used in this process is higher (e.g. dented green avocados, avocados that don't reach the size or are not aesthetically good enough to be sold as fresh fruit on local and international markets).
- **Heatex** is an heat exchanger and pre-malaxer useful for paste conditioning and preparation before entering the Mixing Group (it also helps to reduce the oxidation).

Automatic Mixing System



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- The mixing process or malaxation is a crucial step to prepare and heat the paste before the centrifugal extraction.
- In this phase, the particles in which the oil is contained are broken and they slowly aggregate.
- The average time of paste preparation for avocado oil is about 2 hours (sometimes less, sometimes more).
- This is a very important step of the process because it has a relevant impact on the extraction's efficiency.
- Based on many years of experience, we have seen that the automatic malaxing system is the one that best fits and works in the avocado oil extraction process.

DECANTER 2-3 PHASES



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DECANTER 2-3 PHASES

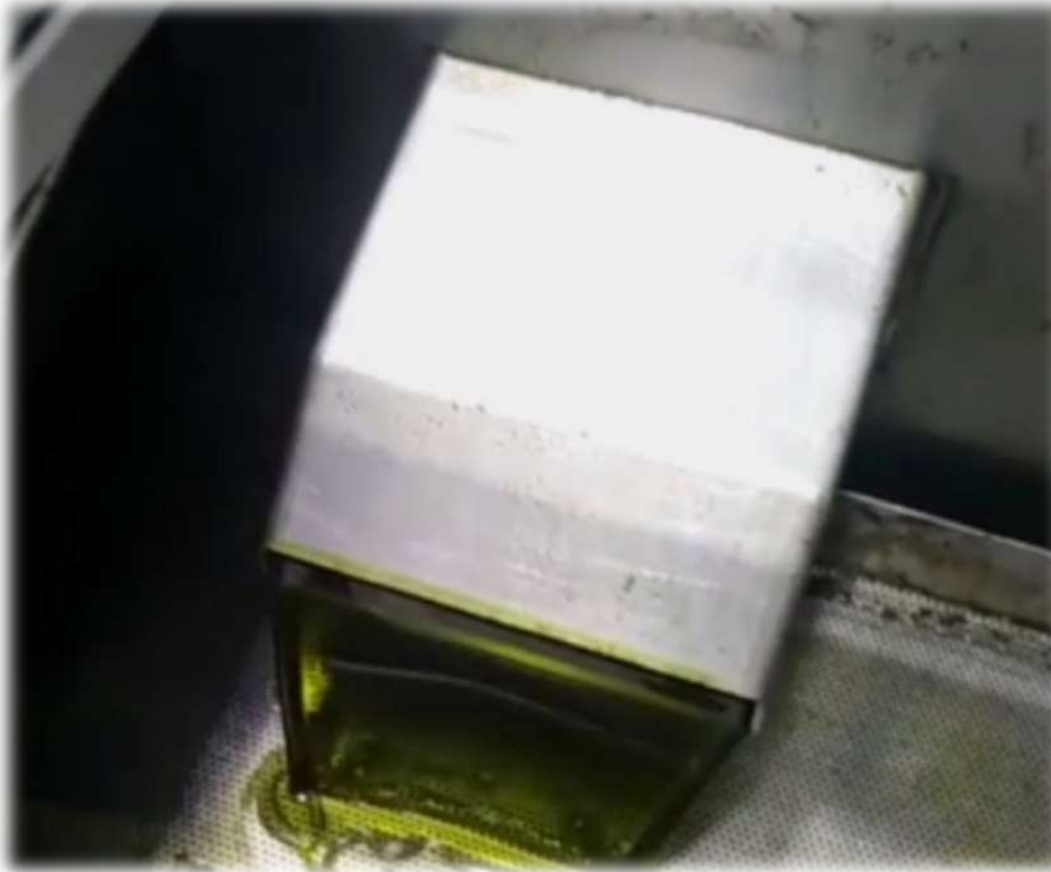


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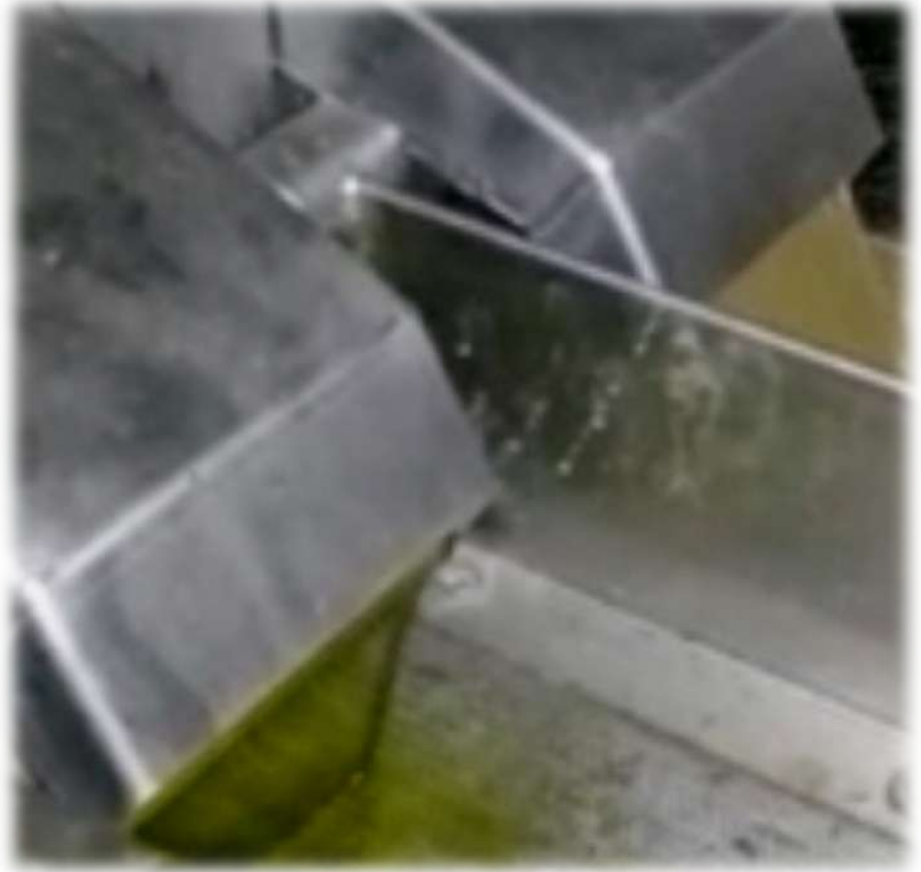
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- Amenduni's decanters can work both in 2 or 3 phases, by appropriate and simple settings of the machine.
- 2 phases means that if the input is the avocado paste (already prepared in the Mixing Group) the output are two: avocado oil and liquid waste (paste without oil, mix of waste water/solid waste).
- 3 phases means that if the input is the avocado paste (already prepared in the Mixing Group) the output are three: avocado oil, waste water and solid waste.
- The decanter runs up to 3.000 rpm, so the oil is separated by the other phases thanks to the centrifugal forces and differences of specific weight among oil, water and solid.

2 PHASES



3 PHASES



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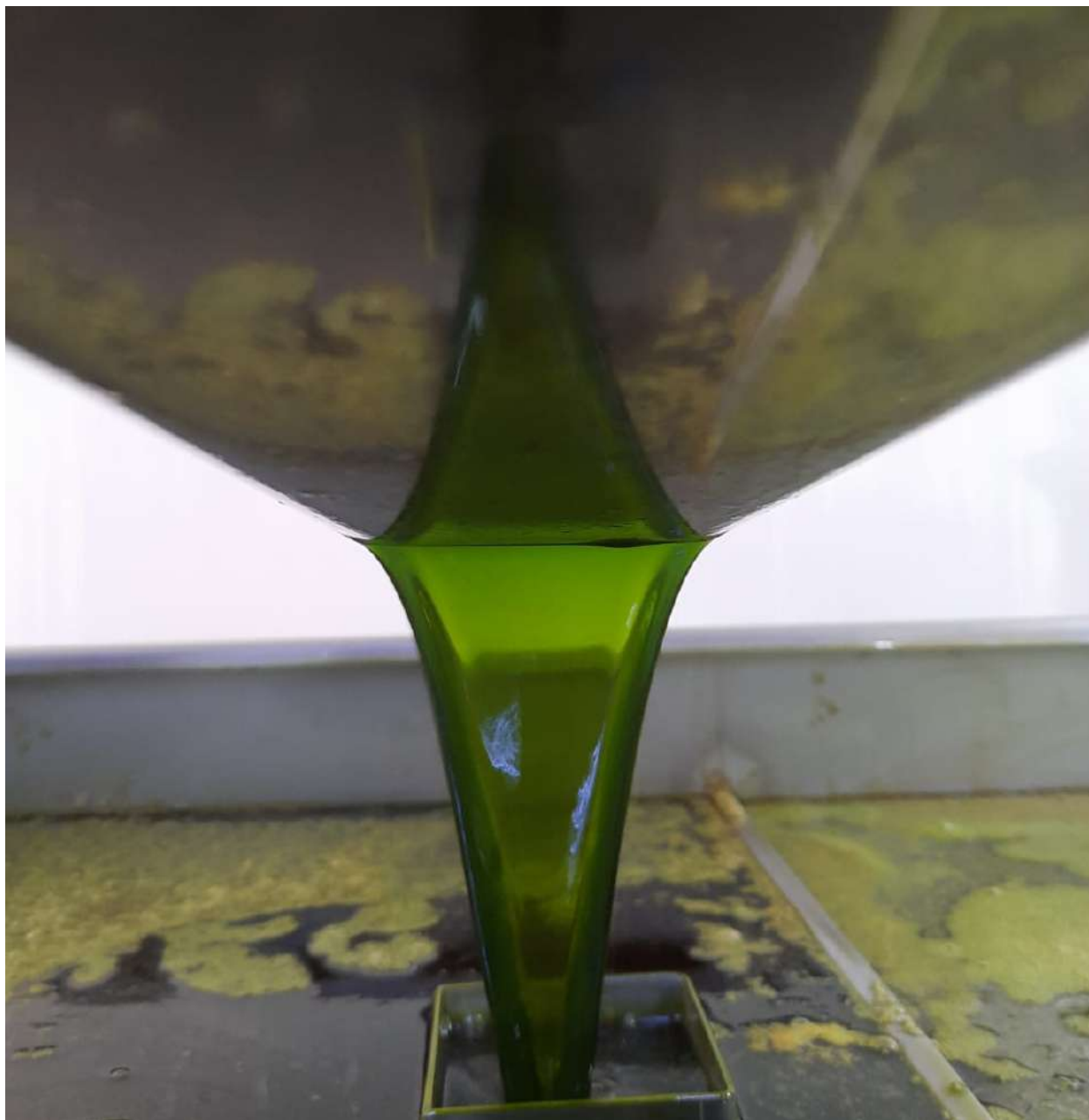
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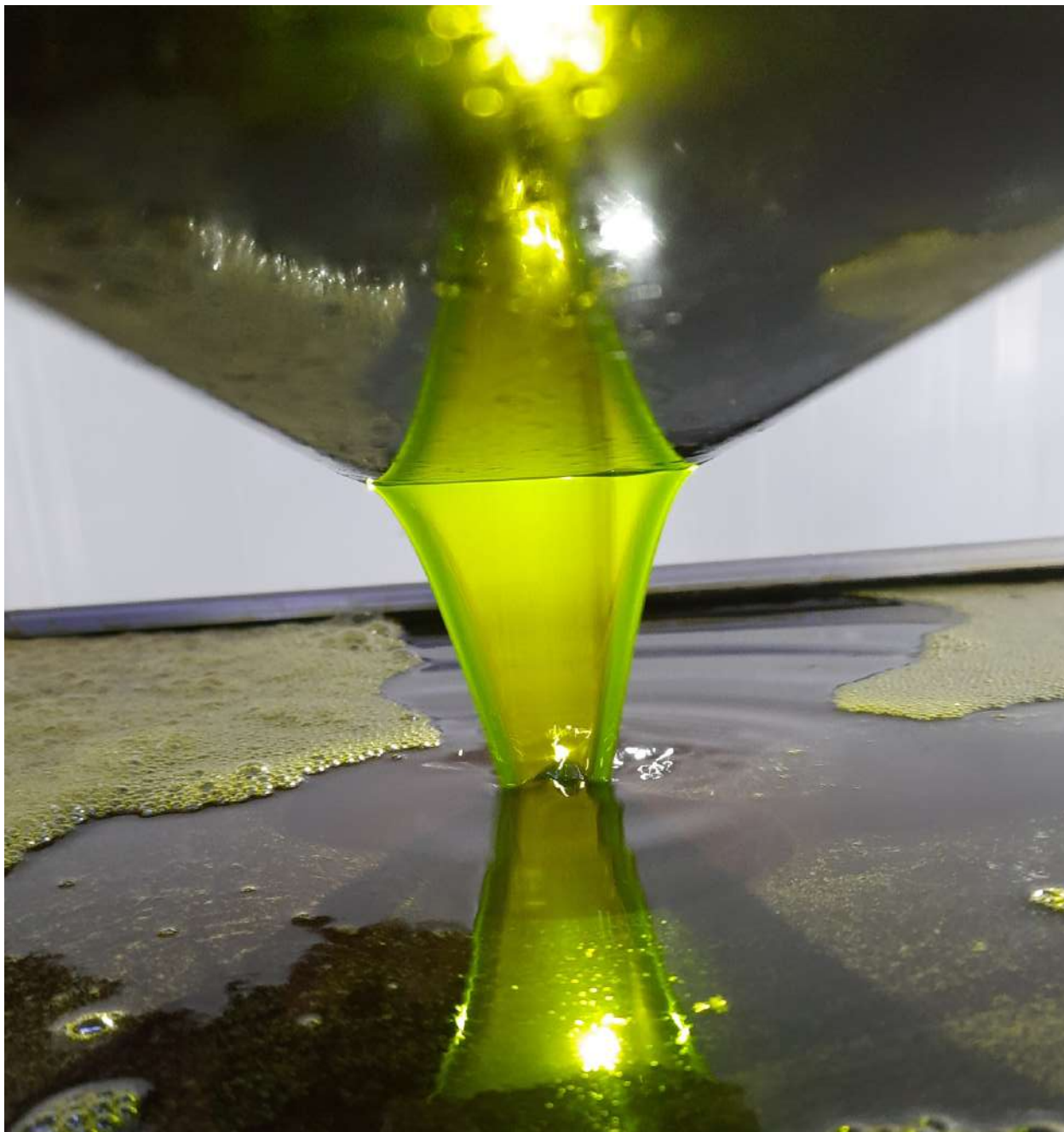
FINAL SEPARATION



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An example of chemical analysis of avocado oil

DESCRIPTION

100% Extra Virgin Avocado Oil made from pulp.

Ideal to prepare all your dishes, bake, cook and prepare vinaigrettes.

The healthy complement of your meals.

PHYSICAL-CHEMICAL

PHYSICAL AND CHEMICAL PARAMETER	SPECIFICATION	UNITS
FREE FATS ACID	≤0.8	% como ac. Oleic
ACID	≤1.6	mg de KOH/g
PEROXIDE VALUE	≤5.0	meq O ₂ /kg
IODINE VALUE	65-85	Cgl2/g
REFRACTIVE INDEX	1.1-1.8	
SAPONIFICATION VALUE	189-199	mg KOH /1g de grasa
HUMIDITY	≤0.1	g/100g

FATTY ACID PROFILE

FAT ACID	RESULT	UNITS
STEARIC	0.21-0.95	%
LINOLEIC	9.74-14.55	%
LINOLENIC	0.79-2.35	%
OLEIC	49.77-67.02	%
PALMITIC	14.53-21.0	%
PALMITOLEIC	5.68-10.71	%
VITAMIN E	8.12-26.40	mg/100g

MICROBIOLOGICAL

	RESULT	UNITS
TOTAL COLIFORMS	<3	NMP/g
FECAL COLIFORMS	<3	NMP/g
YEAST	40ve	UFC/g
MOHOS	10ve	UFC/g

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