

# Seeing is believing

Discover how processing enzymes are proven to improve your olive oil yield

How can you get the very most from your olives without compromising the quality of your oil? To find out, we commissioned an extensive independent study into our Rapidase®Fiber and Klerzyme PowerG enzyme solutions from the Instituto de la Grasa (CSIC) – one of Spain's leading state scientific institutions. These enzymes were used to process Arbequina olives and then assessed on various criteria. The results speak for themselves.

# Introduction to Arbequina olive oil processing

We put our olive oil processing enzyme to the ultimate test and now it's official: based on the extensive testing conducted by the Instituto de la Grasa (CSIC) our enzymes achieve up to an 11 kg extra yield per ton of Arbequina olives. What's more, this is achieved with no effect on the physical characteristics or quality of the oil; and with no traces of enzymes detected in the final product.

## Specifications of the trials

This trial was conducted in November 2022 with **Arbequina olives**, which have the following characteristics:

- Highly aromatic, small, symmetrical and dark brown, with a rounded apex and a broad peduncular cavity humidity: ~ 45%
- Total oil content (wet) ~ 16%
- Total oil content (dry) ~ 30%

## Equipment used in this trial

- Receiving hopper
- Cleaning machine
- Washing machine
- Feeding hopper
- Weighing machine
- Hammer mill and malaxing machine Peralisi
- Decanter Peralisi SPI7 with a capacity of 100 tn/day
- Peralisi P6000 vertical centrifuge

## What is the Instituto de la Grasa (CSIC)?

The Instituto de la Grasa (CSIC) is a highly regarded Spanish state agency for scientific research and technological development – and an authority in its field.



## How was this industrial trial conducted?

Each trial used one ton of Arbequina olives

Trials	Rapidase®Fiber (ppm dosage)	Klerzyme PowerG (ppm dosage)
E1	x	x
E2	250	x
E3	500	x
E4	400	100
E5	200	50
E6	400	100
E7	750	x
E8	x	x



The original CSIC report is available on request by using the "Contact us" QR code.

# Trial results of Arbequina olive oil processing

The test report of the Instituto de la Grasa (CSIC) highlights the following remarkable results:

## 01 Yield increase

The following table from the Instituto de la Grasa (CSIC) report\* shows that the use of enzymes generates:

- up to 11 kg of EXTRA oil gain per ton of olives
- on average 7.3 kg EXTRA oil gain per ton olives

Arbequina	Tests 9/11/22			Tests 10/11/22				
	E1	E2	E3	E4	E5	E6	E7	E8
Increase in kg oil	-	0.98	9.63	11.07	10,09	5.65	6.49	-

## 02 No impact on oil characteristics & organoleptic evaluation

Below table shows there is no significant difference between the control oil and those treated with enzymes.

There is also no difference between the various oils obtained via different doses and formulations of the enzymes.

### Analytical characteristics in oils

	E1	E2	E3	E4	E5	E6	E7	E8
Acidity (% oleic acid)	0.10	0.10	0.11	0.12	0.13	0.14	0.14	0.13
Peroxide index (% meq. O <sub>2</sub> /kg)	5.36	5.36	6.58	4.81	5,14	4.91	5.17	5.53
K270 <sup>1</sup>	0.14	0.14	0.14	0.15	0.13	0.14	0.14	0.13
K232 <sup>2</sup>	1.69	1.69	1.70	1.70	1.71	1.66	1.77	1.58
Delta K <sup>3</sup>	-0.01	-0.01	-0.01	-0.01	-0,01	-0.01	-0.01	-0.01
Humidity (%)	0.06	0.05	0.06	0.06	0.05	0.05	0.05	0.05
Organoleptic analysis (0-10)								
Fruity	4.2	4.0	4.5	4.4	4.2	4.7	4.2	4.0
Bitter	4.1	3.7	3.9	4.0	4.5	4.2	4.6	4.4
Pungent	4.5	4.1	4.8	4.1	4.5	4.3	4.7	4.2

1. K270 is an estimate of the presence of secondary oxidation products

2. K232 is an estimate of the initial oxidation of the oil is made.

3. Delta K: detect if refined oil has been mixed with virgin olive oils

## 03 No residual enzyme in oil

Residues of pectinase activity were not detected in any of the samples analyzed. The analysis is done by an external laboratory, the report is available upon request.

## 04 No impact on phenols and flavonoids content

Individual phenols and flavones, as well as polyphenols, orthodiphenols and total secoiridoid were analyzed for oils process with and without enzyme, the results show no significant differences among all samples analyzed.

# About dsm-firmenich processing enzymes

Our olive oil processing enzymes are good for your efficiency, but they also benefit your sustainability. These easy-to-use, natural processing aids are organic and non-GMO.

## Rapidase® range

Olive oil naturally contain up to 25% oil, and over the past two decades, olive oil production and consumption have been steadily increasing worldwide. So, improving the yield in the olive processing is of great value.

dsm-firmenich's Rapidase®Fiber significantly accelerates olive oil processing by improving filtration performance and yield increase.

At the same time our enzymes can reduce both the dry matter and chemical oxygen demand levels in your Olive Oil Wastewater (OMW). Good for your plant – and good for the planet.

## Try our Olive Oil Calculator Tool

Do you have five minutes to spare? That's all you'll need to discover the potential yield increase and savings you could achieve. Simply scan the QR code below to get started with our easy-to-use calculation tool.



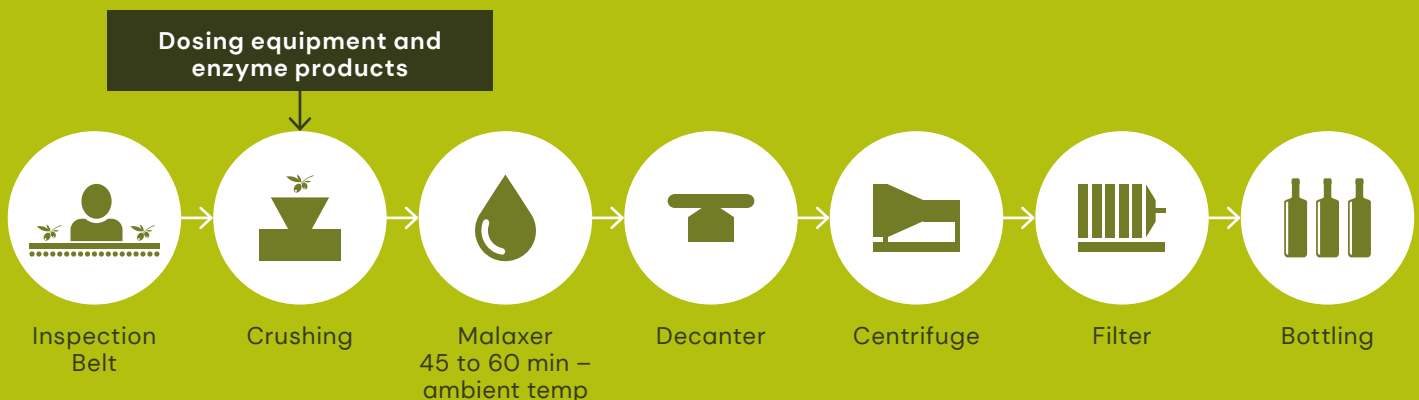
Calculator Tool



Contact Us

## Where does Rapidase®Fiber fit in your production process?

- Can be dosed in either Malaxation or Decanting step
- No extra processing step or incubation time needed
- No heating/cooling needed
- Decreases the viscosity of olive pastes



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