



PULSED ELECTRIC FIELD FOR OLIVE OIL

GREATLY REDUCE MALAXATION TIME, INCREASE YIELD & ENHANCE QUALITY

Improve olive oil processing at lower temperatures, increase yield and gain more EVOO with Elea Pulsed Electric Field.

www.elea-technology.com





Pulsed Electric Field (PEF) is a low-temperature process that improves extraction and accelerates malaxation time. PEF provides many benefits for olive oil, including improving early-season EVOO processing, increasing yield, and enhancing oil quality.

greater yield

PEF lowers the temperature required for malaxation resulting in a significant increase in the amount EVOO gained. Malaxation time is also reduced, enabling greater processing capacity.

improved extraction

PEF treatment increases oil extraction by gently opening pores in the olive's cell membrane, using a precise, targeted and rapid electrical pulse. It is a low-temperature process, reliable and instantaneous, and can be used to treat the olive mash continuously 24 hours a day.

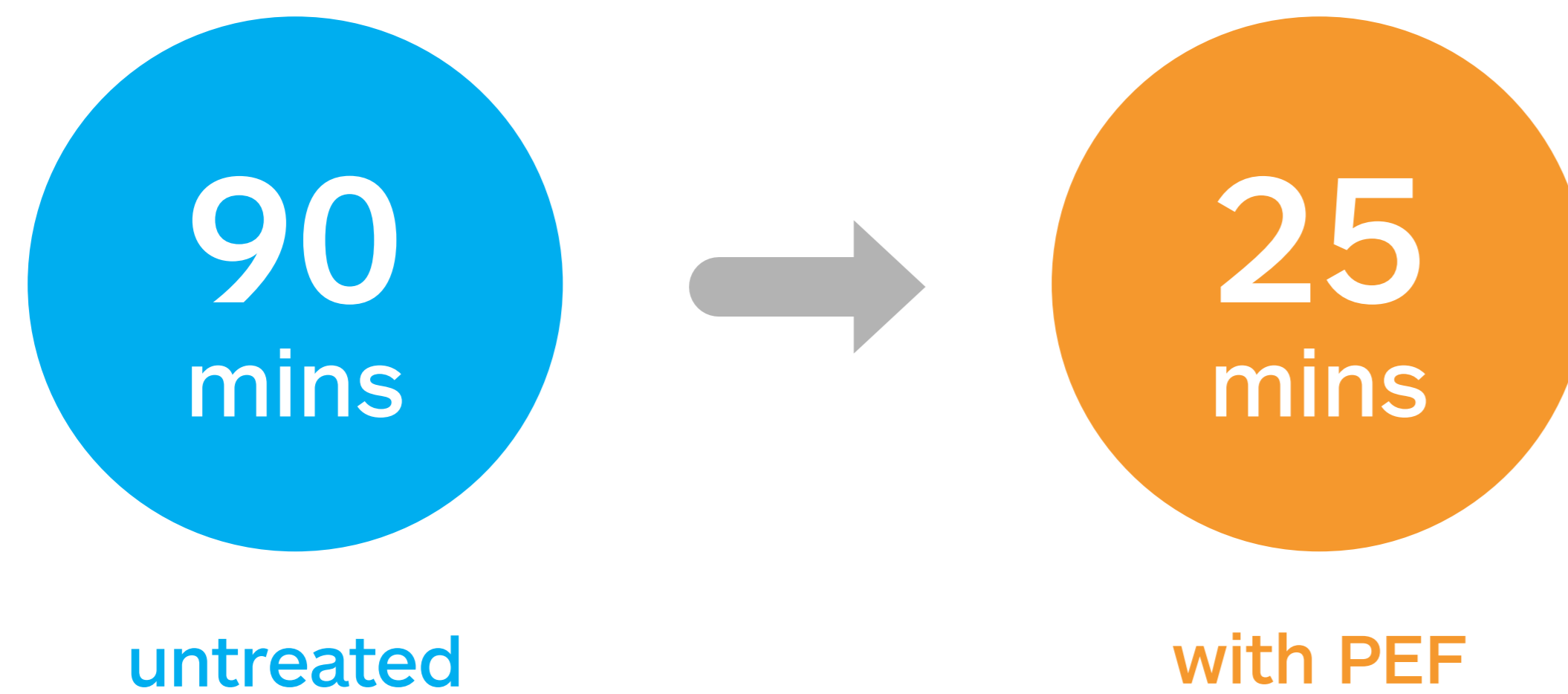
enhanced oil quality

PEF maintains and, in some instances, can improve the quality of the olive oil. Our HPLC study has shown that the number of biophenols in the EVOO is increased by 9-18% due to the PEF treatment.

Professional sensorial analyse of EVOO commissioned by Elea also concluded that Fruitiness, Bitterness and Spiciness were all slightly enhanced by PEF treatment.

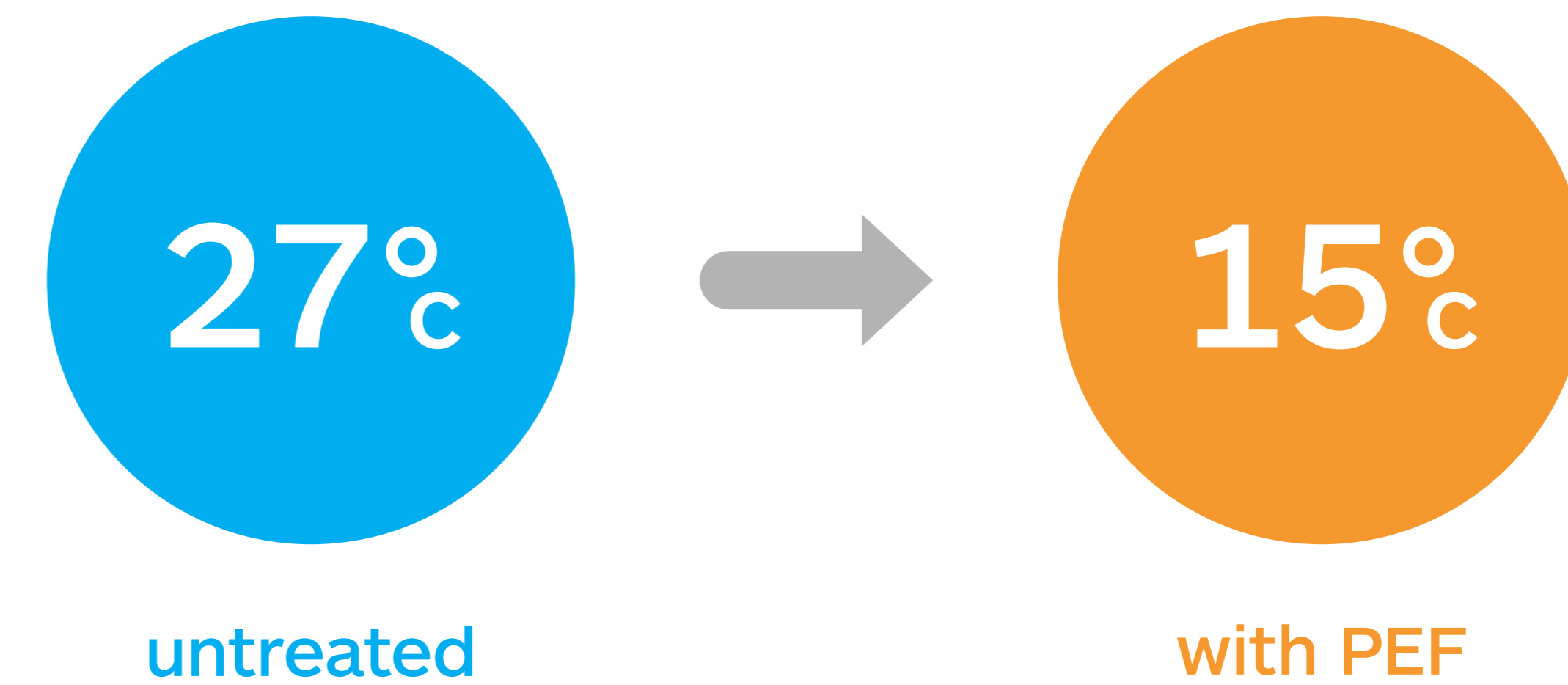


PEF reduces malaxation time increasing process capacity



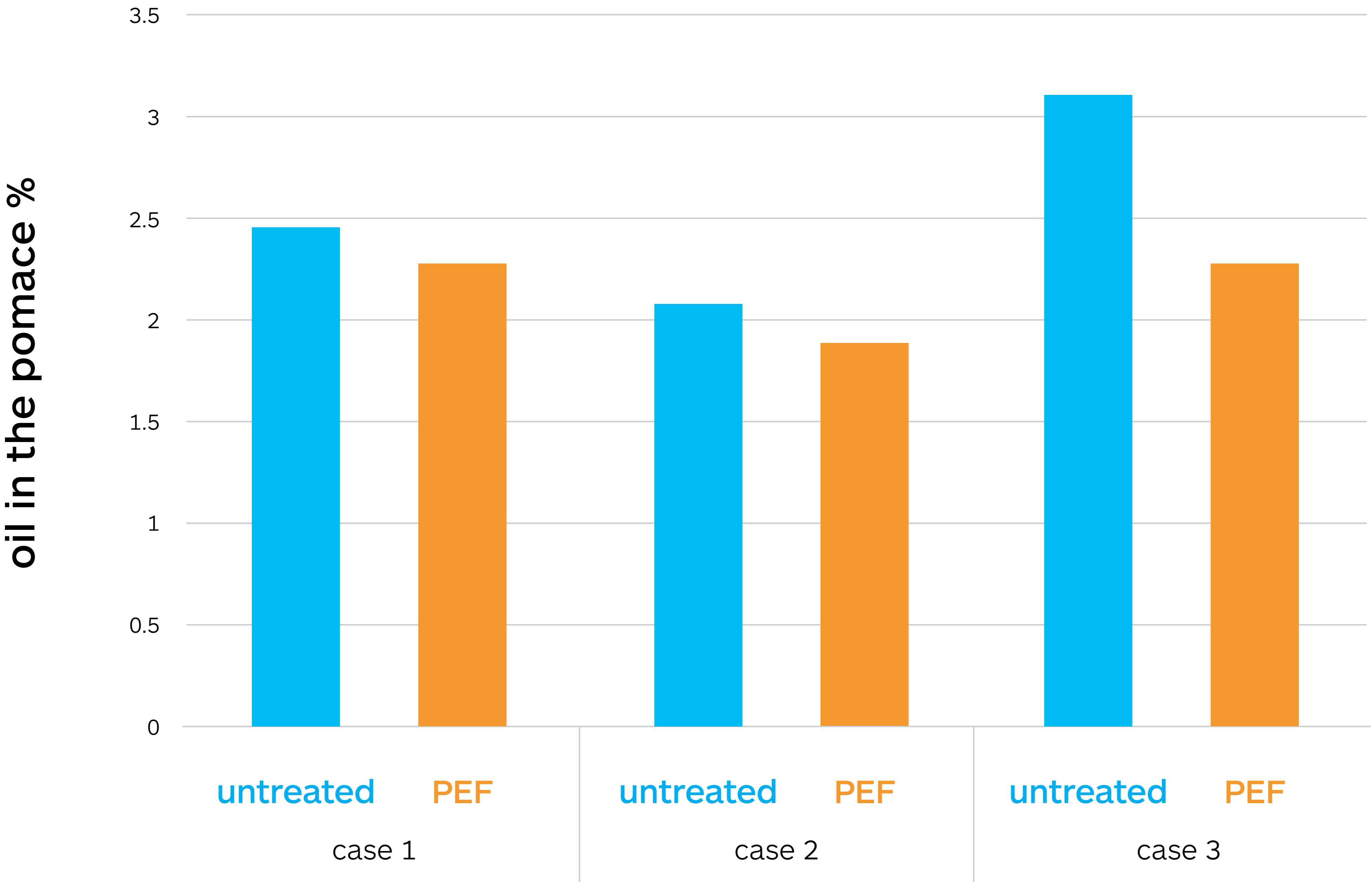
Increase process capacity.
Process more olives early season
and win more EVOO

PEF reduces malaxation temperature capturing more EVOO quality oil



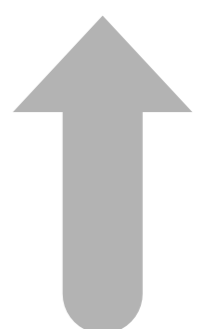
Process olives faster at lower
temperatures for greater yield
and quality

Increased olive oil yield with PEF



90-93%

with PEF



80%

untreated

Improved extraction with PEF treatment results in reduced oil losses in the pomace

All data provided is subject to testing.

Increased EVOO yield cost benefit example

We can illustrate the cost-benefit of PEF with a simple calculation. PEF treatment can potentially increase the oil yield from 20 to 22.7%.

In an industrial oil mill operating at 160 t/day, PEF treatment could increase the EVOO daily production by 4.33 t (from 32 to 36.33 t). Let's assume an EVOO price of 2-4 €/kg; this results in a potential extra turnover of between € 8,660 & € 17,320 per production day.

Data calculated from 160 t of olives per day

€8,000 - €17,000

Value from more solids.
2-4 €/kg approximate EVOO cost



4.33t

Per day increase



2.7%

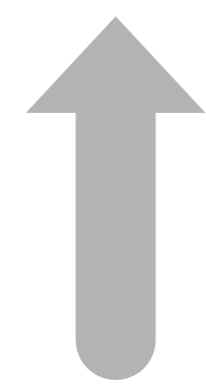
Increase in EVOO quantity

Increased olive oil quality with greater retention of biophenols

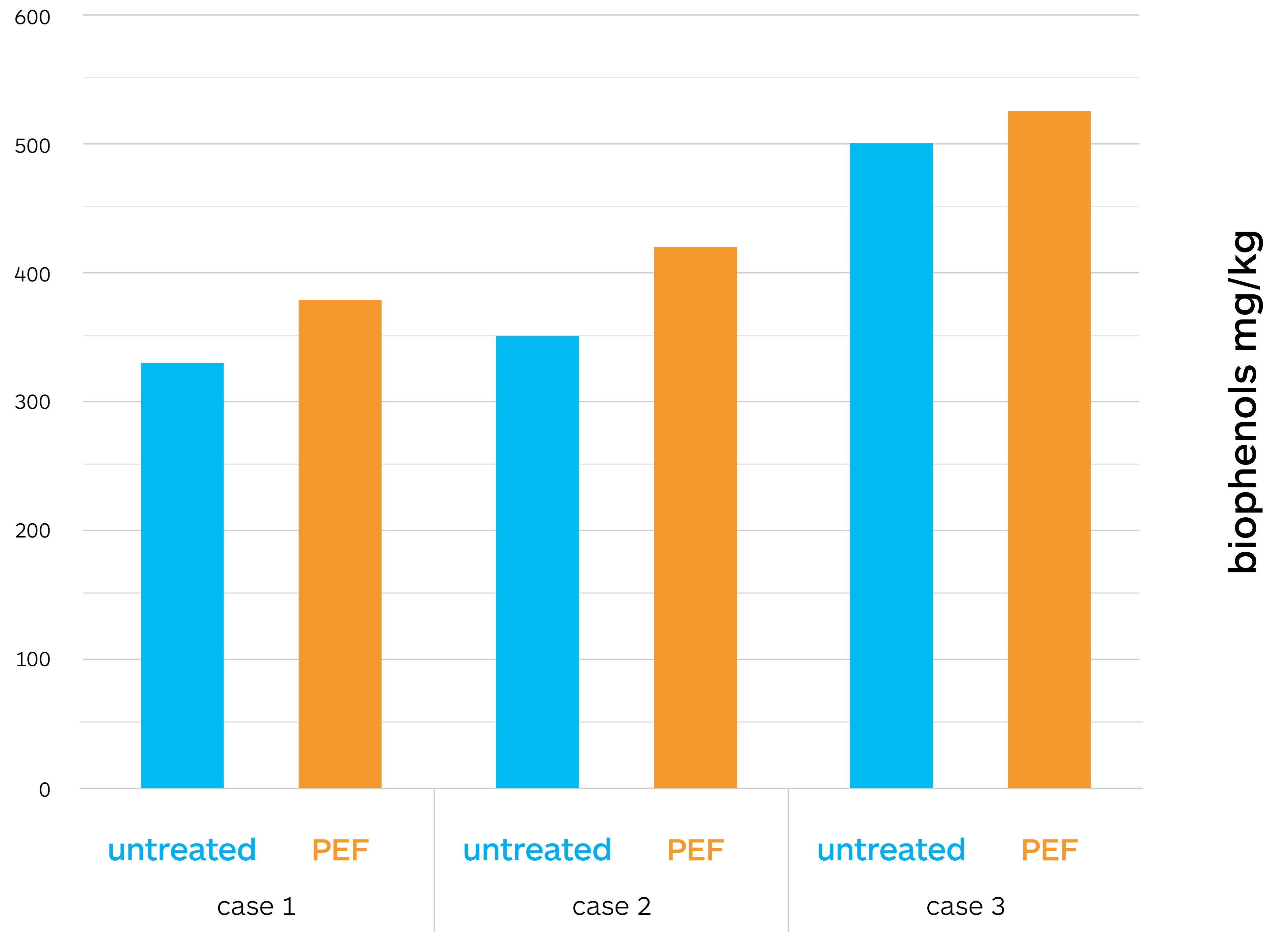
Pulsed Electric Field improves the quality of the olive oil by retaining greater amounts of biophenols resulting in more EVOO.

9-18%

increase of EVOO with PEF



untreated



Noticeable increase of fruitiness, bitterness and spiciness by independent panel testing

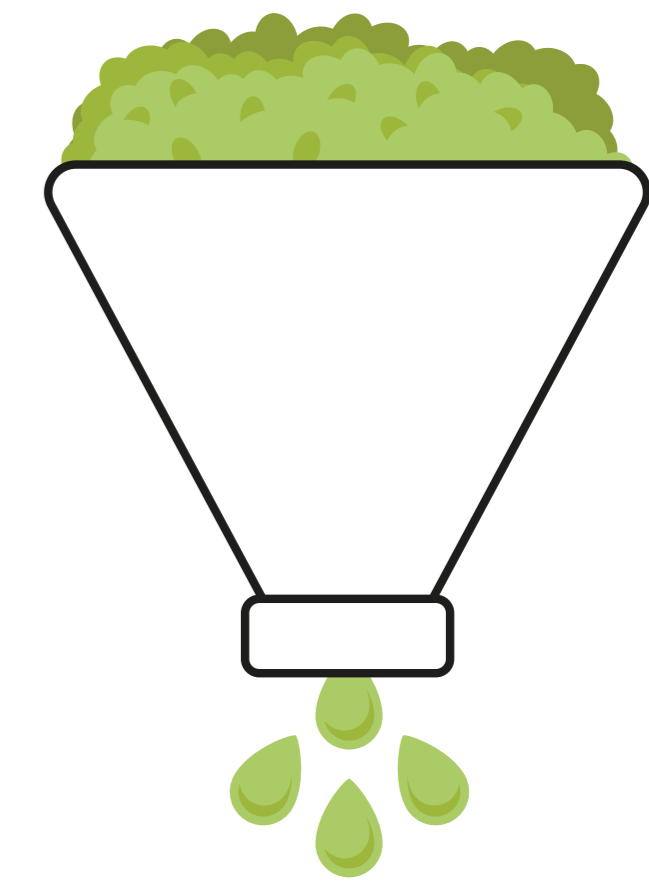
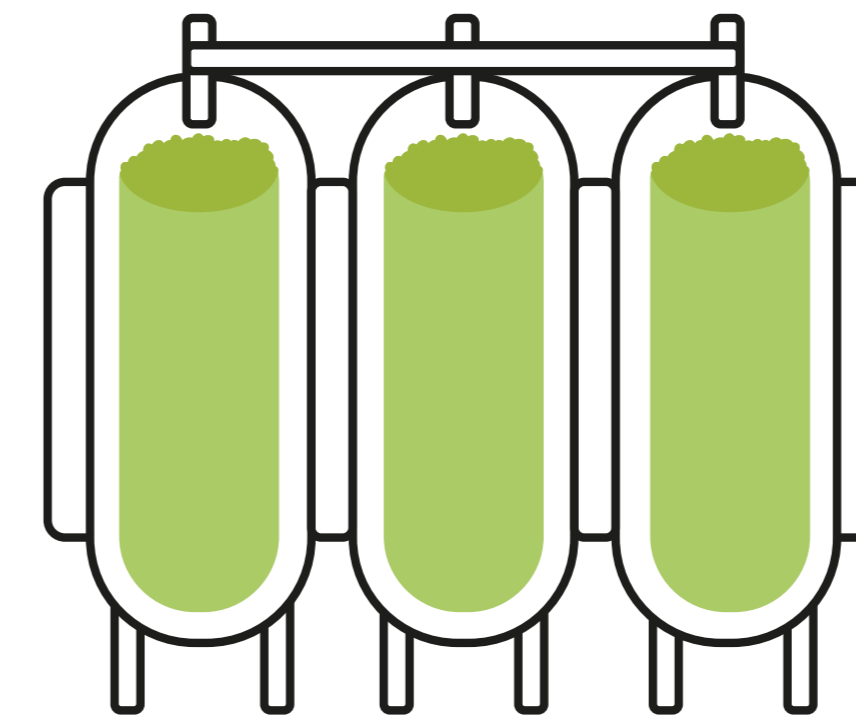
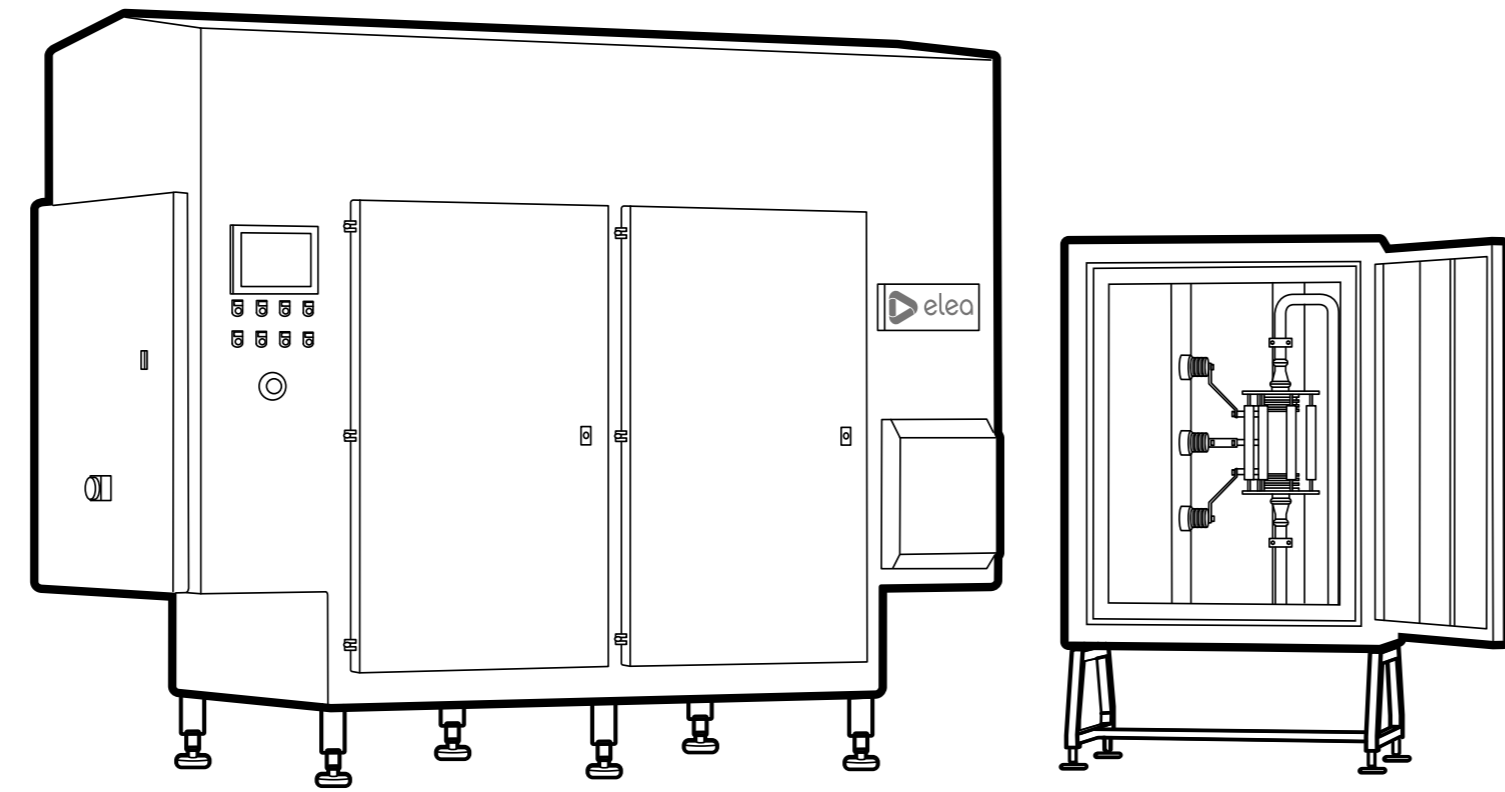
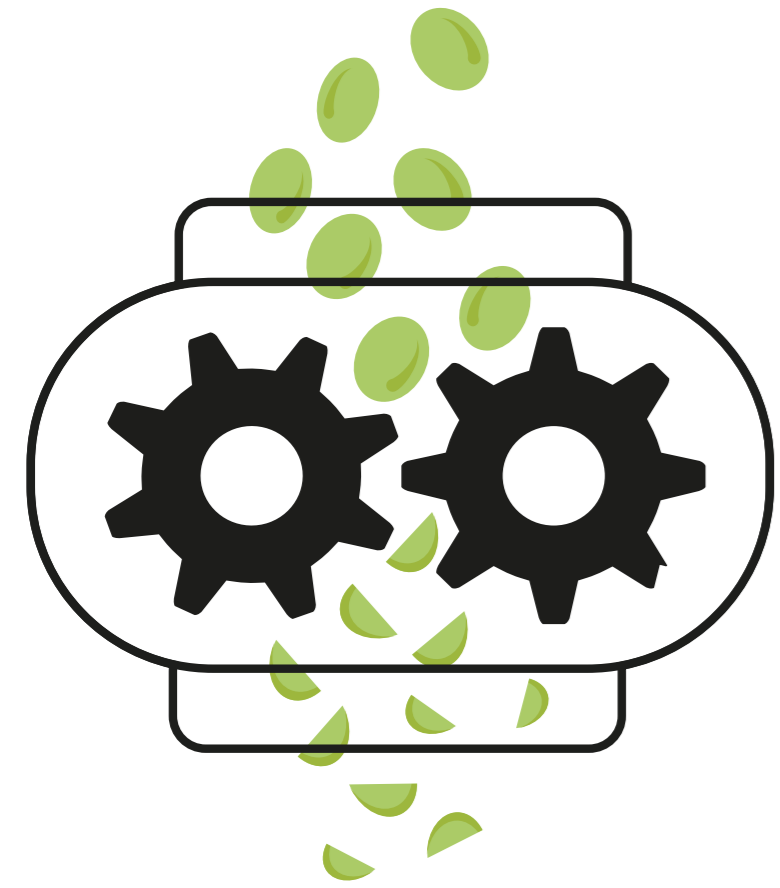
We had our PEF treated olive oil assessed for quality by Mulitchrom lab in Greece.

An independent blind tasting panel compared untreated and PEF treated olive oil and recorded an increase in quality in all three taste categories used to grade EVOO.

panel testing results

	untreated	PEF
Fruitiness	4.5	4.6
Bitterness	3.1	3.3
Spiciness	4.1	4.4

A compact design and small footprint enable easy integration into your production line



Elea PEF Advantage P system

Shorter malaxation time
90 min → 25 min

Lower malaxation temp
27-32 °C → 15°C

Improved oil extraction
Higher yield



The Elea PEF Advantage P 1, 10, 100 & 1000 system range suitable for olive oil processing

We offer a range of different sized Elea PEF Advantage P systems suitable for processing olives with varying line capacity.

In addition, we provide a design and build service to customise Elea PEF technology to your specific requirements. All of our systems share the same 24/7 production capability and are designed to operate under extreme conditions.

The range can fulfil capacities between 7 t/h and 30 t/h. Each system has a hygienic integrated design that is CIP and SIP ready.

Designed to be easily and fully integrated into your existing production line with minimal disruption.

Elea systems put control in the hands of the operator and offer customisation of the process parameters. Close monitoring ensures compliance with all HACCP requirements, and the modular design of the Advantage™ Pipe is simple to configure and easy to maintain.



Our Elea PEF systems are designed and built by us at our specialist facility in Germany.

PEF Advantage P features

control system Touch screen, measurement of peak voltage and current, connectors for oscilloscope, safety interlock, emergency off.

cooling Air or water cooled depending on system.

Continuous Treatment Chambers

capacity Up to 30 t/h of pumpable products, subject to load ratio and process requirements.

electrodes Titanium.

Services Required

power supply 400/415 V, 50 Hz (3Phase/Ground), 100 A. Other options available.

cooling Air or water cooled depending on system.



The Elea PEF Advantage P 1000

Up to 30 t/h of pumpable products, subject to process requirements.



The Elea PEF Advantage P 10 - 100

Up to 20 t/h of pumpable products, subject to process requirements.



The Elea PEF Advantage P 1

Up to 7 t/h of pumpable products, subject to process requirements.



Elea have the facilities, expertise and experience to develop the best PEF solution for your olive oil product

With over 175 systems installed world wide we are the world's leading supplier of Pulsed Electric Field solutions.

Elea work closely with clients to provide tailor-made solutions that best suit their individual requirements.

Our PEF experts operating from the Elea custom-built PEF pilot hall in Quakenbrück, Germany, can help you get the best PEF solution for your olive oil product.

We can also place our PEF systems in your production line for onsite-trials.

Contact us for more information on how we can test PEF with your product.



test PEF on your olive oil with Elea



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manufacturer of Pulsed
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PEF Advantage systems
already installed globally

elea-technology.com