Olive oil processing

The positive benefits of olive oil for nutrition have been known for more than 2000 years. With the increasing awareness of the importance of healthy nutrition, the consumption of olive oil, especially extra virgin quality, has steadily increased over the years.

Pectinex® Ultra SP-L, a processing aid, is used to improve yield through the cell-wall-degrading activities of the enzyme. The second effect of the enzyme is the destabilisation of the oil-water emulsion, which leads to easier separation.

Benefits

The main benefits of using Pectinex Ultra SP-L in olive oil production are:

- Improved oil quality: In addition to the quality-preserving properties of Pectinex Ultra SP-L throughout the process, olives treated with Pectinex Ultra SP-L give the oil better storage stability. The oil shows an increased content of polyphenols, antioxidants and vitamin E (tocopherol), which stabilises the oil against rancidity. As a result of a more complete oil extraction, the organoleptic profile (taste and flavour) is improved.
- Increased yield: Depending on the separation system used and the variety of olive, an additional 10-20 kilograms of oil can be obtained from 1 ton of olives using Pectinex Ultra SP-L.
- Improved use of equipment: Smoother operation of decanter and press due to the emulsion-breaking action of Pectinex Ultra SP-L. The separation is also speeded up considerably as a result of the fast and sharp oil-water phase.
- Dryer cake with lower oil content: The cell-wall-degrading activities of Pectinex Ultra SP-L reduce the oil content of the pomace by at least 10%. This means less pomace for organic solvent extraction and hence higher-value oil.
- Lower oil content in vegetable water: As a result of enhanced phase separation before and in the centrifuge, the vegetable water contains less oil and the total solids are reduced. The enzymatic degradation of carbohydrates into fermentable sugar improves the biodegradability.
• Improved filterability of the olive oil: The enzymatic breakdown of organic polymers significantly reduces the impurities in the olive oil. The benefit is improved filterability (reduction in filter aids and filter material).
• All types of processing equipment: Pectinex Ultra SP-L offers its considerable benefits regardless what kind of process equipment is used. No special equipment is needed, regardless of whether a press system or decanters are used.

Products
Pectinex Ultra SP-L is a natural enzyme preparation produced by the fungus Aspergillus aculeatus. As well as the different pectolytic main activities, Pectinex Ultra SP-L contains various side activities, hemicellulase and cellulases. These enzyme activities are naturally present in small amounts in the olive cells and are responsible for the softening of the fruit during maturation.

More information on the above-mentioned product can be found in the Customer Centre.

Performance
Inside the olive cells, the oil is found in large droplets in vacuoles and in small droplets in the cytoplasm.
The addition to the malaxation of Pectinex Ultra SP-L (mainly comprising pectinases, hemicellulase and cellulases) of the same type as the naturally occurring endogenous enzymes speeds up the process. The bound oil is released due to the degradation of cell material, and valuable substances such as antioxidants and taste- and flavour-determining compounds are set free from the fruit to a greater extent. Due to the lipophobic character of the enzymes used in this process, no detectable traces are left in the oil, and the enzymes do not have any side activity that could have a negative impact on the oil quality.

Usage
In discontinuous lines, a diluted enzyme solution (if possible 10% in cold, clean tap water) is added directly into the stone mill divided into 3-4 portions. In continuous lines, the solution can be added either directly into the mill or into the first compartment of the malaxing unit. In continuous lines, the use of a simple dosing pump is recommended.

Application/process type
Pectinex Ultra SP-L can be used on press systems, leading to freer run oil, with the result that more mats per stack can be loaded. Pectinex Ultra SP-L is also suitable for decanter systems because, as a result of the emulsion-breaking activity and consequent easier oil-water separation, a higher throughput means increased capacity.
Dosage
The recommended dosage is 200 ml Pectinex Ultra SP-L per ton of olives regardless of what system is used. Furthermore, the combined addition of Pectinex Ultra SP-L and talc, a micronised lipophylic mineral that is also used as a processing aid, gives good results with olives that are known to be difficult to process.

Malaxing/holding time
A malaxing/holding time of minimum 20 minutes is sufficient for the enzyme.

pH and temperature
Pectinex Ultra SP-L works optimally at the natural pH of olives. Pectinex Ultra SP-L works at ambient temperature and is active in the range 15-50°C.

All processing parameters are highly dependent on the olive quality, variety and ripeness, and on the processing equipment used.

Safety in use
Pectinex Ultra SP-L used in the extraction process cannot be traced in the oil. Enzymes are generally hydrophilic and cannot therefore enter into the oil phase. This has been investigated and confirmed by determination of residual enzyme activity in olive oil.

Safety, handling and storage
Safety, handling and storage guidelines are provided with all products.