# VALORIZATION OF THE WHOLE HIGH OLEIC SUNFLOWER PLANT IN A LOGIC OF BIO-REFINERY AND CIRCULAR ECONOMY

## COSMETIC MARKET

Hélène Ducatel*, Carine Alfos**
* 33 avenue Paul Claudel, 80480 Dury, France - ducatel@extractis.com
** 11 rue Gaspard Monge, parc industriel Bersol 2, 33610 Canejan, France - c.aflos@iterg.com

## LIPIDS

## OIL CAKE

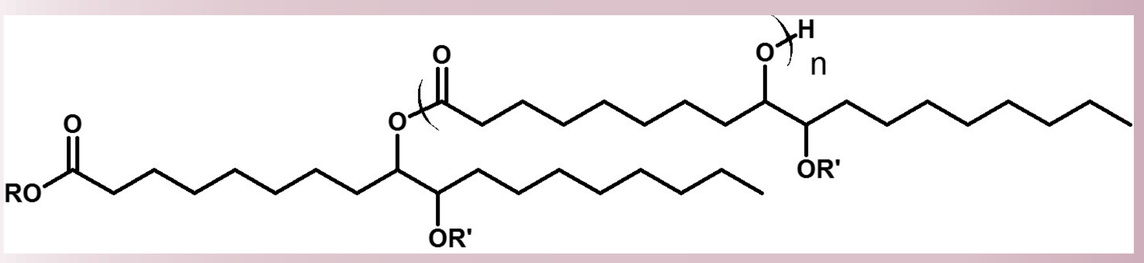
## REFINING

### physical / chemical

CEDOP PLATFORM

Technological platform dedicated to oleochemistry, allowing the intensification of the processes and the realization of industrial preseries to test the market and to promote the development of biomolecules. For cosmetics market, this platform allows the custom manufacture of functional derivatives.

**>> New BioBased Polyesters from vegetable oil: PRIC Generation**



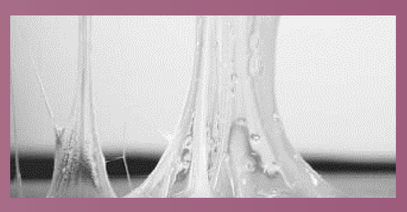

ITERG, in close collaboration with LCPO, created a very specific range of castor oil derivatives used as a raw material for innovative polymers "PRIC generation" ; the aim is actually to replace castor oil with high oleic sunflower oil, made in France.

**Exemple of PRIC 100:**

- Thixotropic improvement of a gloss
- Good dispersing agent UV filters
- Best spread of a sunscreen

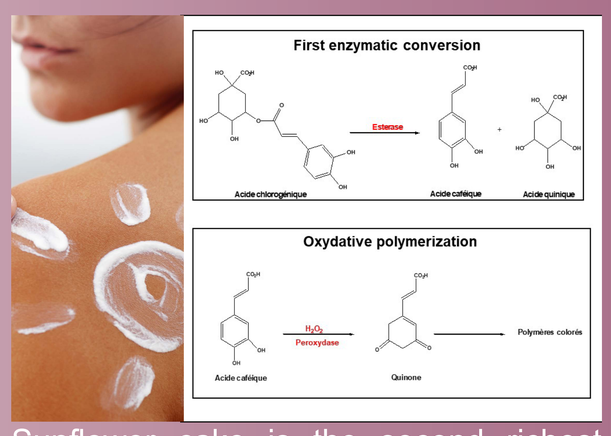
Defatted sunflower cake
↓
Solubilization pH 9,2
1 hour, 50°C
↓
Liquid/solid separation
2 steps: decantation + clarification
↓
Proteins Precipitation: pH 4,5
↓
Liquid/solid separation:
centrifugation
↓
Washing
↓
Liquid/solid separation:centrifugation
↓
Neutralization pH: 6,5 - 7,0
↓
Spray-drying
Purity of Protein Concentrate: 75 to 80%

**>> Application: Adhesive**



Defatted sunflower cake
↓
Aqueous extraction
↓
Solution enriched with chlorogenic acid
↓
Conversion
↓
Solution enriched with caffeic acid
↓
Solvant extraction
↓
Purified caffeic acid > 90%
↓
Polymerization
↓
Soluble natural melanin

**>> Application: Natural melanin**




Sunflower cake is the second richest vegetable source in chlorogenic acid after unroasted coffee. Extractis has accompanied an industrialist in the scale-up of a process for the production of vegetal allomelanins simulating the Lab color of the natural tan of human skin.

EXTRACTIS PLATFORM

## DEODISTILLATES

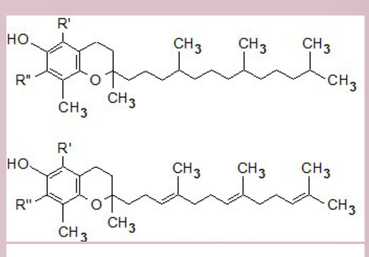
### Coproducts from refined oil

**>> Obtaining concentrates of tocopherols and sterols, powerful antioxidants**

CEDOP PLATFORM

Processes:

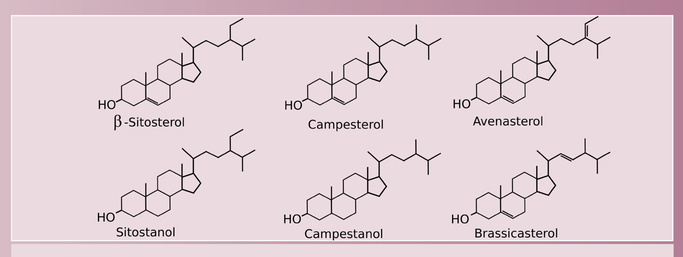
- Saponification
- Concentration of DOD before saponification
- Esterification way




**Vitamin E** consists of a mixture of molecules, which are called tocopherols or tocotrienols.

The most active molecule and the most present in the human body is called alpha-tocopherol.
It is the most important antioxidant, it protects the body's lipids, including cell membranes, from oxidation. Oxidative damage is associated with premature aging.

Thus, it is often used in cosmetic, pharmaceutical and food preparations




Recent studies have shown that **phytosterols** are directly involved in skin defense processes by regulating the mechanisms of inflammation. Able to mitigate inflammation (redness, edema ...), they are used to soothe reactive skin. With a structure similar to DHEA, phytosterols participate in the renewal of the hydrolipidic film. They accelerate the synthesis of cutaneous phospholipids and give a firmer appearance to the skin.

Properties :

* Repairer, it promotes the regeneration of the epidermis.
* Soothing, it relieves reactive skin or subject to discomfort.
* Improves the elasticity of the skin and makes it softer.
* Promotes hydration of the skin.
* Strengthens the protective barrier of the skin.

This active ingredient is also a texture agent, it gives consistency and viscosity in formulation.

## CONCLUSION

**Creation of sectors on the national territory is a challenge for both agricultural world and industrial users of these biomasses.**

**Bioeconomy is a major issue in the coming decades.**

**In order to promote these developments and highlight the Made in France, it is necessary to promote the entire plant in a logic of biorefinery to make it economically viable and respond to societal issues and consumer demand.**