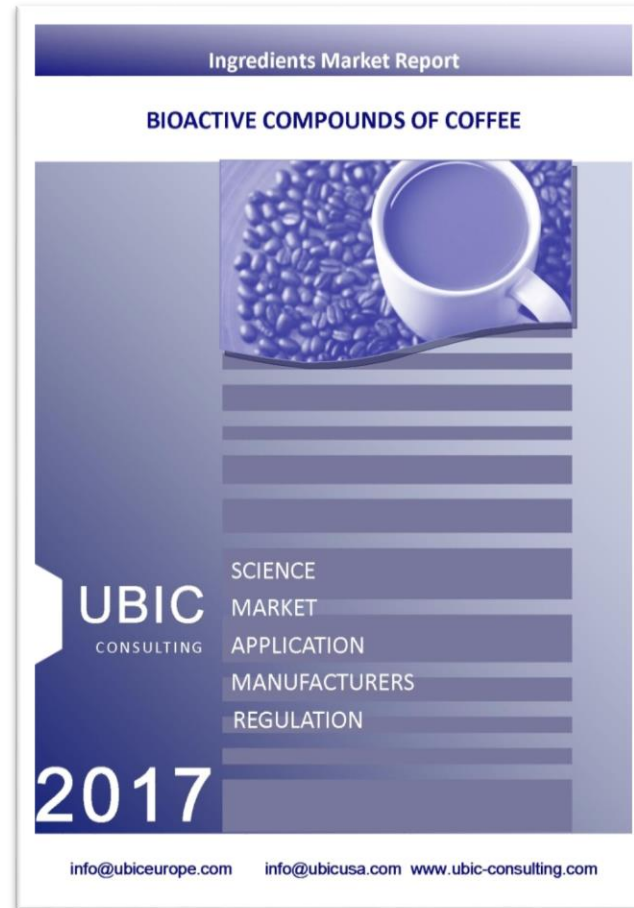


# THE BIOACTIVE COMPOUNDS OF COFFEE

Science Regulation Market

# UBIC 2017



Scientific background

Process

Regulations

Glance at the market

## ► Content of the UBIC's report

The important impact that coffee had and still has , made it not only a popular beverage all over the world , it also made it an interesting field of scientific research , matter of fact, its components have been extensively researched. UBIC's report presents some major information related to coffee with a special focus on its composition of bioactive compounds and the effects of these compounds on health matters.

scientific background

- What about coffee ?
- what are the bioactive compounds of coffee ?

Coffee and Health : Diseases impacted by coffee consumption

- Cardiovascular diseases
- Neurogenerative diseases
- Diabetes type 2
- Cancers
- Depression

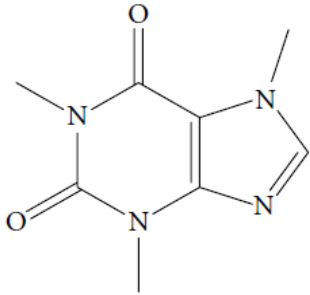
Ingredient covered : Bioactive compounds of coffee

- Caffeine
- Trigonelline
- Chlorogenic acids
- Diterpenes

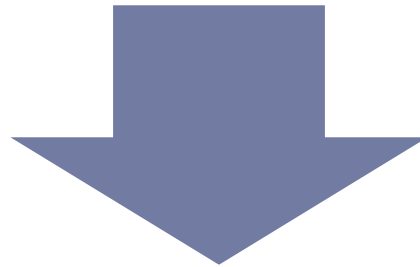
Coffee Market and Manufacturers

- Coffee market in 2016 : Production , consumption and coffee trade.
- Main manufacturers in coffee's two biggest producers : Brazil and Vietnam.

## ► Caffeine

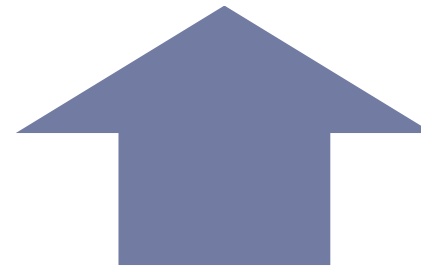


- ✓ The most known among coffee's bioactive compounds.
- ✓ Chemical formula : (C<sub>8</sub>H<sub>10</sub>N<sub>4</sub>O<sub>2</sub>)
- ✓ Responsible for only 10 % of coffee's bitterness.



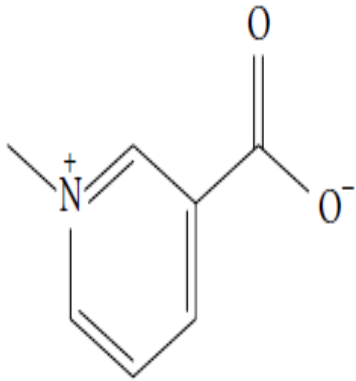
- High doses of caffeine may overstimulate the nervous system.
- Withdrawal from caffeine ingestion may cause lower mental alertness, diminished performance, and over sleepiness.

- It has an ergogenic effect.
- Its has a stimulatory activity with some promising results, in persons with Parkinson's disease and Alzheimer Disease too.
- It has an analgesic effect.



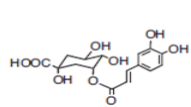
## ▶ Trigonelline

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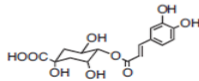


- ✓ It is the most abundant alkaloid in green coffee beans after caffeine.
- ✓ About 50-80% of the Trigonelline is decomposed during roasting.
- ✓ It has an antidiabetic effect
- ✓ It is associated with an in vitro regeneration of dendrites and axons of cortical neurons.
- ✓ It has antimicrobial capacities against caries.

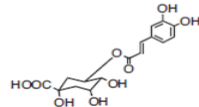
## ▶ Chlorogenic acids



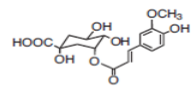
3-O-Caffeoylquinic acid



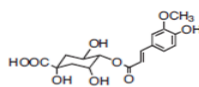
4-O-Caffeoylquinic acid



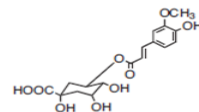
5-O-Caffeoylquinic acid



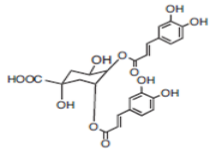
3-O-Feruloylquinic acid



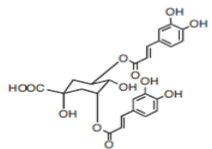
4-O-Feruloylquinic acid



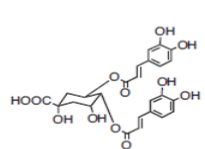
5-O-Feruloylquinic acid



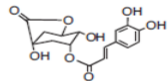
3,4-O-Dicaffeoylquinic acid



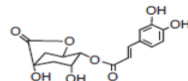
3,5-O-Dicaffeoylquinic acid



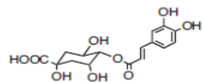
4,5-O-Dicaffeoylquinic acid



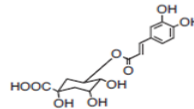
3-O-Caffeoylquinic acid lactone



4-O-Caffeoylquinic acid lactone



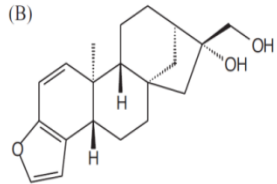
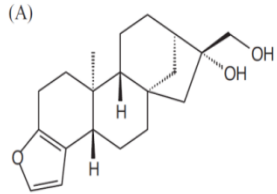
4-O-p-Coumaroylquinic acid



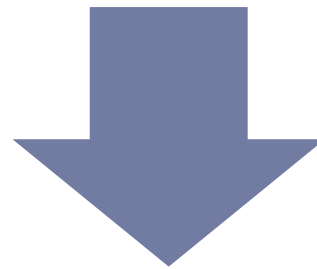
5-O-p-Coumaroylquinic acid

- ✓ By definition a chlorogenic acid (CGA) is a natural chemical compound which is the ester of caffeic acid and quinic acid.
- ✓ coffee has a group of chlorogenic acids.
- ✓ These acids have antibacterial, antifungal and antiviral functions.

## ▶ Diterpenes



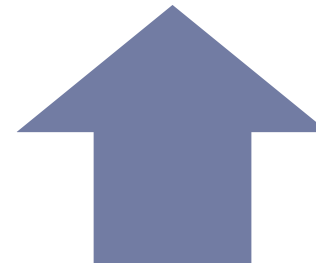
- ✓ Diterpenes are a group of terpenoids commonly found as secondary metabolites in terrestrial and marine organisms.
- ✓ Coffee contains mainly two forms of diterpenes : Cafestol (A) and Kahweol (B).



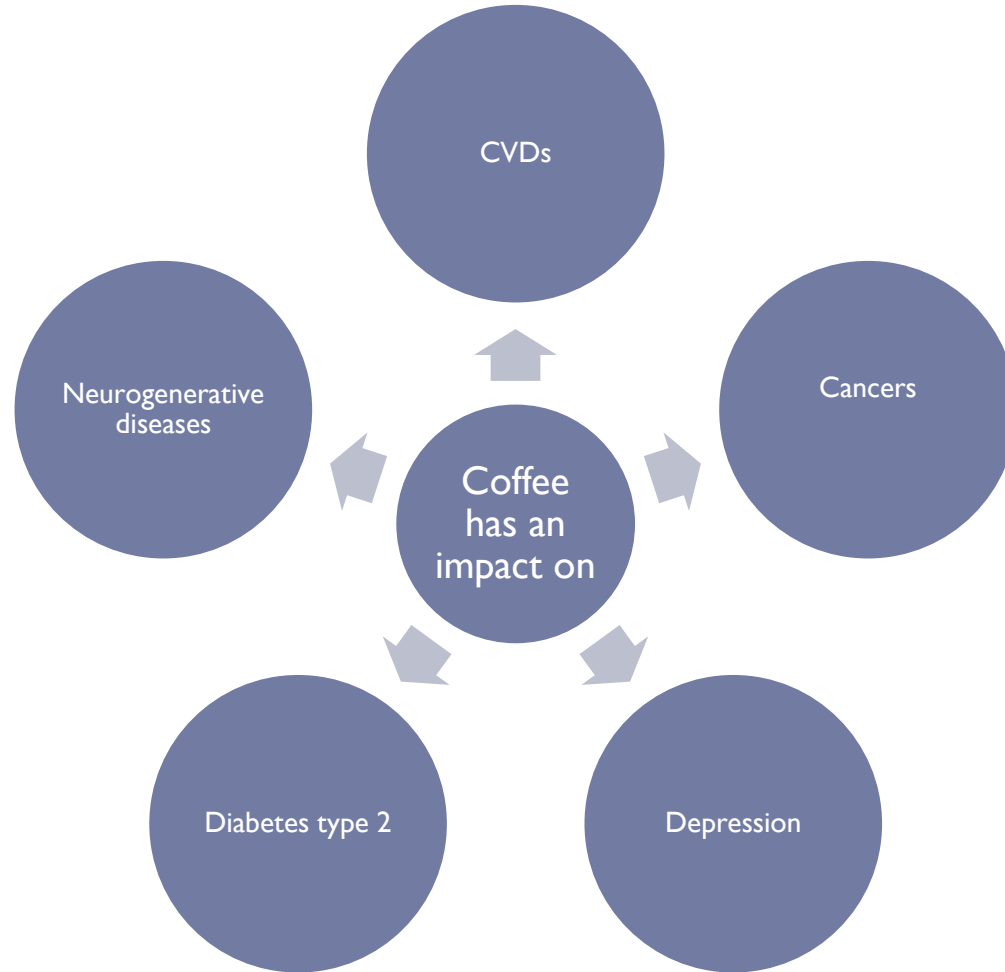
-High consumption of these compounds can be associated with a risk of developing cardiovascular issues.



Coffee diterpenes have exhibited anticarcinogenic and hepatoprotective properties in vitro.



## ► Diseases impacted by coffee consumption



## Pros and cons of coffee regarding health matters

---

### The Pros :

- ✓ Research has shown that coffee consumption a reduction impact of Parkinson's ,Alzheimer's and Diabetes type 2.
- ✓ Coffee can protect against cancers of the liver, prostate, endometrium, breast, and pancreas.
- ✓ Coffee is associated with antibacterial and antiviral properties.

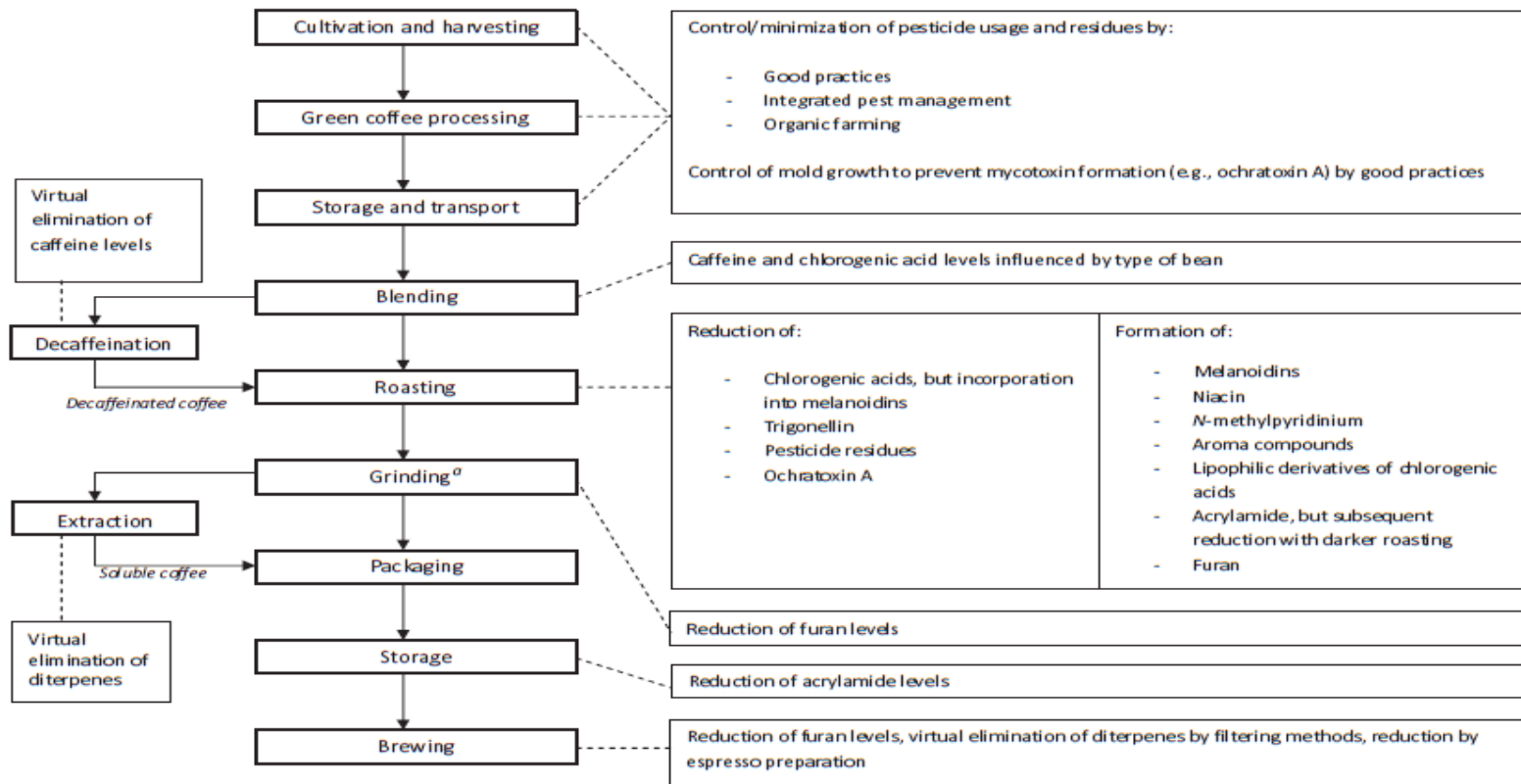


### The cons :

- ✓ Coffee ,if overly consumed , may cause changes in one's sleep pattern.
- ✓ Acute caffeine intake also increases the urinary excretion of minerals such as calcium.



- ▶ Process :Effects of coffee processing on bioactive compounds. (a) some products are not ground as part of the industrial process but sold as whole bean.



## ▶ **Coffee organizations, Laboratories and coffee's actual market around the world**

- ✓ The report contains informations regarding coffee organizations like the International Coffee Organization (ICO) and it also lists some laboratories specialized in coffee.
- ✓ The report dedicated a segment to discuss coffee's market :
  - World coffee production and consumption in 2016 .
  - Main importers and exporters of coffee in 2016.
  - Examples of key companies from the two major countries producing coffee: Brazil and Vietnam.

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