**Proposition de stage de Master 1– 2022**

**Impact of incorporation of pomaces (specially pectins) on vegetable juice viscosity**

Location: INRAE research center, Avignon, UMR SQPOV

This work will be carried out within the UMR SQPOV – Sécurité et Qualité des Produits d’Origine Végétale (INRAE) under the supervision of Carine Le Bourvellec (tel 04.32.72.25.35), and Sylvie Bureau (tel 04.32.72.25.09) and Alexandre Leca (04 32 72 2543).

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**Context and objectives**

New processing pathways are investigated to increase efficiency and sustainability of resources in the agrifood value chain. Two biorefinery pathways are chosen which are: high quality juices and soups. The objective is to valorize the vegetable residues (pieces of carrot, stems of broccoli, external leaves of cabbage, green leaves of leek…) that are not currently valorized and are seen as a net loss for growers and first processing industries. A second type of residues corresponds to the pomaces, byproducts obtained during the juice and soup production, which can be valorized too into functional ingredients to improve organoleptic and nutritional qualities of soups and juices for human consumption.

The objective will be to evaluate the organoleptic and nutritional properties of soups and/or juices after the addition of ingredients, mainly polysaccharides, extracted from pomaces.

The aim of this Master research project will be to understand the impact of ingredients, i.e. essentially polysaccharides, extracted from pomaces (apple, citrus…) on the texture, taste (sugars, acids), and nutritional microconstituents (polyphenols and carotenoids) of soups or juices (for example carrot, broccoli, leek, cabbage…). The characteristics of fresh and processed vegetables and of pomaces were already determined.

**Key words:** vegetable, soup, juice, pomace, organoleptic and nutritional composition.

**Experiments and methods:**

In order to understand the effect of incorporation of pomaces (especially pectins) in juices and soups on viscosity according to the quantity and quality of pectins and interactions between juice and soup matrix and pectins, different steps will be performed:

- On a simplified juice (mimic the carrot juice)

- On a real juices of carrot

Different qualities and quantities of pectins (commercial or extracted pectins) will be added on both, simplified and real juices, and the impact will be evaluated on the organoleptic and nutritional traits.

The main methods used to evaluate the organoleptic and nutritional traits will be:

- Texture, rheology

- Infrared spectroscopy, Near and mid-Infrared

- Characterization of sugars and organic acids

- Characterization of polyphenols (HPLC-DAD)

- Characterization of carotenoids (HPLC-DAD)

- Extraction and characterization of polysaccharides (UV-vis, GC-FID, GCMS)

- Data analysis/statistics