



## **Lab & Quality control**

Our laboratory is fully- equipped to perform micro extractions, quality control techniques as well as research and development.

Our analytical tools range from simple to sophisticated ones such as pH meters, refractometers, moisture/carbon determining balances, analytical balances, microscopes, TLC-Scanners, AAS, GCs, HPLCs, GC-MS, LC-MS, UV, VIS, and FTIR.

In addition our microbiology department is equipped with sterile facilities, incubators and culture counters.

## **Manufacturing**

### ***INTRODUCTION***

Extraction is the process used to recover natural extracts, essential oils, colorings and aromas from plant parts, flowers, fruits and seeds. In general, extraction is done by adding suitable solvent such as ethanol, methanol or water to plant materials and allowing the desired substances to dissolve into the solvent and form an emulsified mixture called miscella. The miscella is then further concentrated by evaporation and dried to form the final product. In conventional method of extraction such as maceration, the Plant material is mixed with the solvent multiple times till desired yield is achieved. This process required large amount of solvent which translated to higher costs of concentrate.

Herbaios implements German extraction technology of percolation that is highly superior in both quality and efficiency. With this process, Herbaios can produce extracts containing maximum active ingredients while using minimum amount of solvent. Herbaios extracts are of world-class quality as they are clean and hygienic with no degradation from heat, stress and oxidation and manufactured under high standards.

### ***PLANT MATERIALS USED***

Most plants and herbs are cultivated on about 200 ha of fertile land located 700m above sea level at the foot of Mount Lawu. The cool climate and the clean, fresh air make it an ideal ground for growing crops.

The crops and seeds are harvested with modern equipments and sorted to select the best quality plant materials. Then, they are washed to remove dirt, soil, and contaminants. In order to remove moisture, they shall be dried naturally. Next they will be cut and grinded to increase surface area for extraction.

### ***MANUFACTURING TECHNOLOGY***

Maximum active ingredient, minimum solvent

High yields can be attained by continuous countercurrent extraction of plant materials. Countercurrent extraction involves solvent and plant materials circulating through a series of percolators in reverse directions, Miscella from one percolator flows to the next and in the process becomes more concentrated.

When the optimum concentration is reached, the miscella is withdrawn to the evaporation plant. Fresh solvent is then added to the percolator containing the least amount of active ingredients in order to completely extract all the active ingredients. In this way maximum extraction yield is guaranteed and solvent use is minimized. It has been determined experimentally that the amount of active ingredients left in plant materials after extraction can be as low as 0.08% GMP, FDA and 3A

Herbaios adheres to the highest & strictest standards in manufacturing.

Equipments & pipes in contact with products are made of high quality stainless steel 316L otherwise mentioned. All operating procedures are standardized to comply with stringent regulations. Herbaios is designed & built according to European GMP, FDA & 3A guidelines in order to manufacture products of the highest standard & quality.

# Extraction Flow Chart

