

NEWCAFF™ microcapsules

SUSTAINED CAFFEINE RELEASE WITH A CLEAN TASTE



CLEAN NON-BITTER TASTE

CONTROLLED RELEASE

HIGH LOAD OF CAFFEINE

CLEANER FORMULAS

DESCRIPTION

NEWCAFF™ microcapsules is a novel caffeine delivery system which has been designed to mask the bitter taste of caffeine and to provide for its sustained release. **NEWCAFF™** microcapsules comes in two different versions: **60%** and **75%** caffeine content.

COMPOSITION

60%: Caffeine, candelilla wax, carnauba wax, medium chain fatty acid triglycerides.

75%: Glycerol esters of fatty acids, caffeine.

A NUTRITIONAL VIEW

Caffeine is a methylxanthine alkaloid which is well-known for its properties in the central nervous system, its action as metabolic stimulant, as well as fatigue reducer. In this respect, caffeine can enhance athletic performance, team sport activity and better body coordination. The postulated mechanism is that caffeine delays the depletion of muscle glycogen and encourages working muscles to use fat as a fuel by mobilizing fat stores. Caffeine has also been shown to have significant effect on cognitive parameters such as concentration and alertness.

Caffeine however, is quickly absorbed and therefore its stimulating effect can be felt instantly after consumption leading to energy fluctuations. In addition, this compound has a bitter taste which confers undesirable organoleptic properties which compromises its addition into food systems.

One of the trends driving the sports nutrition market growth is the sustained energy claim. Following this trend, there is currently a need for caffeinated products which can continuously provide the desired benefits associated to caffeine without the unwanted effects for a longer time.

This need can be met by **NEWCAFF™** microcapsules which was designed by using lipid hot-melt fluid bed microencapsulation technique to provide a controlled release of caffeine with the additional benefit of masking its objectionable bitter taste. Thus, to avoid the addition of ineffective and unhealthy high amounts of additives to mask its bitter taste.

APPLICATIONS

Energy powder blends, bars, gels, chewables, food supplements, milkshakes, confectionery and chewing gum, etc.

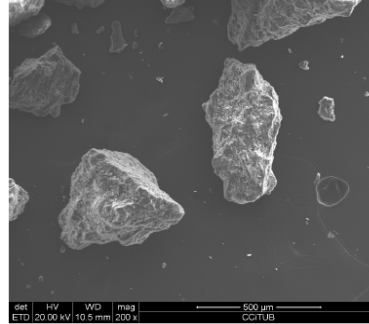


CHARACTERIZATION

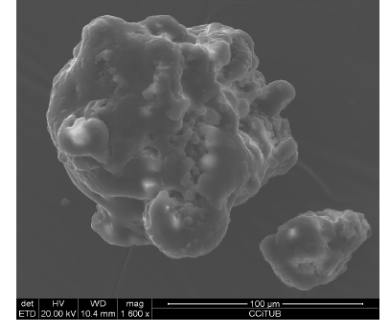
Morphology and physicochemical characteristics of

NEWCAFF™ microcapsules

TEST	SPECIFICATION
Color	White to light brown
Caffeine Content	60%, 75%



SEM image of caffeine



SEM image of **NEWCAFF™-60** microcapsules

SCANNING ELECTRON MICROSCOPY

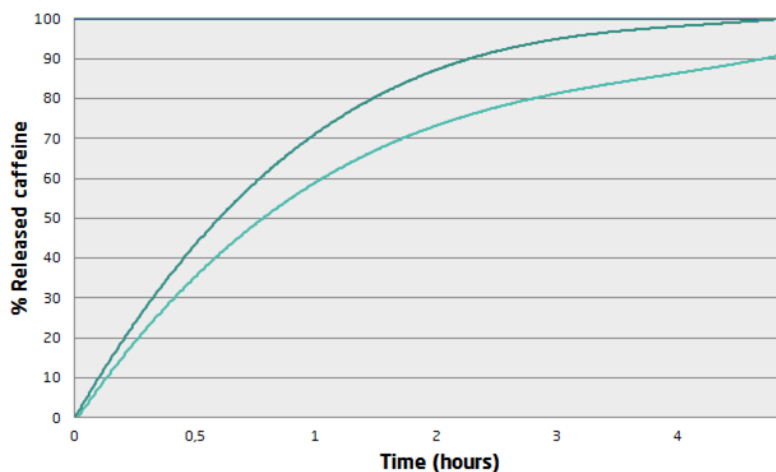
SEM observations show caffeine powdered particles with an angular shape and polyhedral appearance; on the other hand, microcapsules containing caffeine have a round shape with little granules adhered to its surface forming the lipid insulating coating.

*Caffeine particles received an uniform and stable wrapping via **NEWCAFF™** microcapsules technology successfully masking the bitter taste of caffeine.*

IN VITRO RELEASE PROFILE

Caffeine release from the **NEWCAFF™** microcapsules was tested using a standard method following the Health Canada official method of determination of the disintegration time DO-25 by being submitted to digestion process. For this purpose, the analysis was carried out simulating in vitro digestive conditions at physiological temperature (37°C) and at physiological stomach and intestine pH.

A SUSTAINED RELEASE OF THE CAFFEINE FROM **NEWCAFF™ microcapsules IS OBSERVED**
Both versions showed a good retention and an improved in vitro sustained release profile when compared to unencapsulated caffeine.



— RAW CAFFEINE — **NEWCAFF™-75** microcapsules — **NEWCAFF™-60** microcapsules