



MUSHROOM BIOSCIENCE

NEW EVIDENCE ON COGNITIVE IMPAIRMENT

## Hifas da Terra has developed a new product with positive impact on memory and cognitive impairment

- Improvements in attention, memory, concentration, processing speed and visuospatial skills.
- The trial was developed in the final phase of the Neurofood R&D&I project, which assessed the effects of a functional food product developed by Hifas da Terra and Cuevas y Cía.
- The mushroom extracts selected for the product used contain active compounds such as GABA (a natural neurotransmitter) and ergothioneine, two substances which affect the maintenance of cognition, stress and insomnia.

Spain, 17<sup>th</sup> June 2021.- Hifas da Terra (HdT) and Cuevas y Cía announced the results of the Foltra Health Centre (Foltra Foundation) trial, which showed that the daily intake of a **new mushroom product has a significant impact on critical aspects of neurological health such as memory and attention**, and may also be useful in cognitive impairment associated with conditions such as Alzheimer's disease.

The presentation, "**New functional foods and nutritional supplements aimed at neurocognitive development**", was delivered during a Zoom event by **Dr. Esteban Sinde, the scientific director of Hifas da Terra; Tania Blanco de La Iglesia, the head of quality control at Cuevas y Cía; and, Dr. Aurora Camacho, medical director and Mr. Carlos Agra, head of Neuropsychology, on behalf of the Foltra Health Centre (Foltra Foundation)**. The event was also attended by representatives of the consortium formed for the Neurofood project, such as **Sergio Baamonde López, technical R&D manager for Algas Atlánticas Algamar, S. L.**

All study participants were assessed by neurological tests, before and after taking the product developed for the trial. These tests evaluated cognitive functions such as memory, orientation, recall, attention and processing speed, among others. The work also included tests related to the cardiovascular system and nursing needs.

## Medicinal mushroom nutrients protect against neurocognitive decline

The product developed during the Neurofood project, **Mico-Neuro**, contains a selection of naturally occurring nutrients from **Lion's Mane** (*Hericium erinaceus*) and **Shiitake** (*Lentinula edodes*), medicinal mushrooms cultivated and processed by Hifas da Terra, which play an important role in cognitive development.

The initial phases of the Neuro-food innovation project facilitated the selection of the most suitable mushroom species for the end product. This also allowed for optimisation of the cultivation processes so adequate levels of the **natural neurotransmitter GABA and ergothioneine** could be ensured, both substances with proven effects on cognitive processes.

In addition, during the Neurofood project, the researchers at Hifas da Terra developed processes to increase the concentration of GABA in the extracts produced, and were able to validate in vitro the functionality of some of the developments, with the collaboration of ANFACO,

### Test Results

Based on improvement indicators, conclusions of the trial indicate that **the product developed by Hifas da Terra and Cuevas y Cia could be useful for the general population as well as for people who need to improve their neurocognitive function**. In addition, the professionals from the Foltra Foundation pointed out that the research carried out in the neurological field, **"shows the validity of the clinical protocol proposed by the researchers in the short duration of the study"**.

### Memory and concentration

The authors observed that, after consumption of the Neurofood product, neurological **tests showed a marked improvement** in skills related to **memory, recall, immediate recall and ability to concentrate**.

### Attention and processing speed

In addition, study participants were able to process more items in less time after ingesting the product, resulting in **better selective and sustained attention**.

### Visuospatial skills

Another of the aspects highlighted in the conclusions of this study is the **speed acquired by the subjects when executing the instructions given**. Also, in general, the participants **improved their ability to inhibit or block distracting stimuli**.

According to Dr. Esteban Sinde and Tania Blanco de La Iglesia, the Neurofood product was formulated based on the conclusions of the early phases of the project. This inspired the newly developed product's name, Mico-Neuro. This functional food was created after evaluation of the **optimum levels of bioactive mushroom compounds, their concentration and their bioavailability**. Foltra's medical manager, Dr. Camacho, added that the Neurofood product, **"has no adverse side effects, which broadens the spectrum of application and safety"**.

### New research projects

The authors of the study agreed that these results suggest new avenues of research in which the composition of patients' gut microbiota could be analysed before and after the intake of this functional food.

According to Dr. Sinde, scientific journals such as the *Journal of Alzheimer's Disease and Science Advances*, among others, have recently published new evidence which also links the intestinal microbiota with neurological diseases. He pointed out that this demonstrates that a correlation has been established between intestinal microorganisms and the appearance of amyloid plaques in the brain, which is considered a biomarker of Alzheimer's disease.

## Neurofood Consortium (2018-2020)

Algamar, the University of Santiago de Compostela (USC), the University of Vigo (UVIGO), Anfaco-Ceopesca and the Centro Tecnológico da Carne collaborated in the initial phases of the project, which began in 2018.

Neurofood, is an R&D project that received funding from the Galician Innovation Agency (GAIN) through the Conecta-Peme 2018 programme (European Regional Development Fund) and the support of the Galician Regional Government's Department of Economy and Industry and the Galician Business-University Foundation (FEUGA).

## Hifas da Terra

Hifas da Terra is a **biotechnology laboratory** focused on **research and innovation, specialised in the development of healthcare products** based on bioactive molecules of fungal origin.

Among other scientific milestones, it has managed to identify fungal strains with anticancer potential (FungiTechOnco project) and to determine an anti-migratory effect on tumour cells. These results were presented at the 16th International Congress of the Spanish Association for Cancer Research (ASEICA).

Hifas da Terra's principles based on research, innovation and sustainable development have garnered recognition from the Xunta de Galicia and the Spanish Government as demonstrated by more than 13 awards for business excellence, which Hifas da Tera have received.

Hifas da Terra's scientific team has one of the largest banks of fungal strains of medicinal interest in Europe. HdT's private fungal bank is currently larger than the Spanish Type Culture Collection (CECT).

It is also a pioneering research centre for the development of new cultivation and optimisation techniques for obtaining homogeneous production with a high concentration of bioactive substances of fungal origin (with several patents under development).

Hifas da Terra is present in **Germany, the United Kingdom, Ireland, Portugal, Italy, France**, and more, through subsidiaries or distribution agreements, and represents a benchmark in the development of certified organic food supplements throughout the European market. The company has a promising and ambitious expansion plan for 2021, including recent openings in the **American, Asian and Middle Eastern markets**.

## Details of the trial

- The trial was conducted with informed consent with 40 healthy volunteers aged, on average, 53 years, at the Foltra Foundation, a health centre specialising in neurological rehabilitation.
- The centre's medical management team carried out the study in three phases, which assessed neurological and cardiovascular parameters, as well as nursing needs of participants. Data was evaluated before and after ingestion of the product. During the study, patient experience and organoleptic impressions of the tested product were also collected.