Key Value Chain:
Pharmaceuticals and Food Supplements

Euromines
March 2020
Food Supplements

≡ Food supplements are intended to **correct nutritional deficiencies, maintain an adequate intake of certain nutrients, or to support specific physiological functions.**

≡ They are **not medicinal products and as such cannot exert a pharmacological, immunological or metabolic action.**

≡ Food supplements are **concentrated sources of nutrients** (i.e. mineral and vitamins) or other substances like lipids and minerals, with a nutritional or physiological effect that are marketed in “dose” form (e.g. pills, tablets, capsules, liquids in measured doses).
CHROMIUM
≡ Chromium is an essential trace element, the predominant form found in the body is trivalent chromium (Cr3+).
≡ This form of chromium is believed to be involved in normal insulin function. Insulin is key to maintaining the living state and storage of carbohydrates, lipids, and proteins within the human body.

MOLYBDENUM
≡ Molybdenum is vital for many body processes.
≡ Molybdenum cofactor activates four essential enzymes, which are biological molecules that drive chemical reactions in the body.

SALT
≡ An adult human body contains about 250g of salt and any excess is naturally excreted by the body.
≡ Sodium, key part of salt, enables the transmission of nerve impulses around the body. It is an electrolyte that regulates the electrical charges moving in and out of the cells in the body.
Nickel, Copper, Cobalt

NICKEL
≡ Nickel aids in iron absorption, as well as adrenaline and glucose metabolism, hormones, lipid, cell membrane, improves bone strength. Nickel is also present in RNA and DNA.

COPPER
≡ Copper helps to maintain healthy bones, blood vessels, nerves, and immune function, and it contributes to iron absorption, and red blood cell formation.
≡ Sufficient copper in the diet may help prevent cardiovascular disease and osteoporosis.

COBALT
≡ Cobalt is a necessary component of vitamin B12 (hydroxocobalamin) and a fundamental coenzyme of cell mitosis.
≡ Moreover, cobalt is very important for forming amino acids and some proteins to create myelin sheath in nerve cells.
The EU Nutrition and Health Claim Regulations (NHCR) have prompted supplement manufacturers to incorporate micronutrients in their offerings for substantiating the health claims. This has also led to the proliferation of products fortified with vitamins and minerals.

As of 2016, Italy, Germany, and France were among the key markets with approximately 40.0% share. However, Spain and the U.K. have witnessed tremendous growth with a large number of product launches in the past few years.

The market in Europe is estimated to witness changing dynamics as it moves toward consolidation, which is poised to result in several mergers and acquisitions.

In Europe, approximately 131 acquisitions took place between 2007 and 2010, of which nearly 41.0% of the acquiring companies were European.
Natural ingredients for health products in Europe

Various factors currently affect demand:
≡ Growing consumer interest in alternative medicines, such as **nutraceuticals, natural remedies and supplements**, creates opportunities
≡ Europe’s aging population: **increasing life expectancy**
≡ Growing attention to **alternative medicine**
≡ New wave of **innovation and investment** in health products
Strategic Value Chain - for obvious reasons

According to the most recent Ageing Report conducted by the Ageing Working Group of the Economic Policy Committee (EPC) and the European Commission’s Directorate-General for Economic and Financial Affairs (DG ECFIN) in 2018, Europe’s population is ageing at an incredibly high rate.

Even though the EU population is expected to increase to 520 million by 2070, the total number of the working age population will decrease from 333 million in 2016 to 292 million in 2070.

According to a report of the European Federation of Pharmaceutical Industries and Associations (EFPIA), Europe spent more than €35 billion on pharmaceutical R&D in 2017 compared to around €17.8 billion in 2000. Switzerland, Germany, France and the UK were the main contributors to these R&D expenditures.
Clay minerals like kaolin and smectite are among the world's most valuable industrial minerals due to their physical and chemical properties useful for pharmaceutical formulations. They function as lubricants, desiccants, disintegrants, diluents, binders, pigments and opacifiers.

**Typical pharmaceutical activities:**

- Gastric and duodenal ulcer prevention
- Gastrointestinal protection
- Anti-diarrhoea effect
- Dermatological protection
- Laxative quality
- Anti-inflammatory and local anaesthetic effect
Magnesium, Calcium

MAGNESIUM
≡ Magnesium (hydr)oxide is an ingredient of stomach medicines as acid neutralizer such as milk of magnesia, and also used as a safe laxative, for the treatment of constipation.
≡ Adequate magnesium intake has been linked to a reduced risk of heart disease.
≡ The deficiency of magnesium has been reported to be linked with the risks of type 2 diabetes and depression.

CALCIUM
≡ Calcium is required for vascular contraction and vasodilation, muscle function, nerve transmission, intracellular signalling and hormonal secretion.
≡ Calcium is essential for bone health, it is used to treat a condition called osteoporosis, or thinning of the bones.
Copper can it be found in MRI scanners used for diagnostic purposes, as well as nuclear imaging and radiotherapy.

Copper, both in metallic form and in many chemical compounds, expresses antimicrobial activity, and is therefore vital in developing medical equipment.

Copper compounds show vast array of biological actions, including anti-inflammatory, anti-proliferative, biocidal (antibacterial, antifungal, molluscicidal, nematocidal, antiviral). Or an example, it is critical to inhibiting the spread of the influenza virus.

Copper is also used in the treatment of rheumatoid arthritis.

Quick progress in nanotechnology opens new possibilities for design of copper-based drugs and medical materials, e.g. socks with copper woven in against fungal diseases.
Zinc

The Common Cold
≡ Researchers have hypothesized that zinc could reduce the severity and duration of cold symptoms, due to its anti-inflammatory and anti-viral qualities.

Diarrhea
≡ After taking zinc supplements, studies show that patients have shorter courses of infectious diarrhea.

Wound Healing
≡ Zinc helps maintain the integrity of skin and mucosal membranes. It is used to treat skin ulcers and gastric mucosal injury. Moreover, individuals with low zinc levels show to be more susceptible to developing ulcers.

Immune function
≡ These alterations in immune function might explain why low zinc status has been associated with increased susceptibility to pneumonia and other infections.

Age-Related Macular Degeneration
≡ Researchers have suggested that both zinc and antioxidants delay the progression of age-related macular degeneration (AMD) and vision loss, possibly by preventing cellular damage in the retina.
LITHIUM
≡ Salts of lithium such as lithium carbonate play an essential role in the treatment of bipolar disorder, a mental illness that typically involves alternating states of mania and depression.

SILVER
≡ The medical uses of silver include its use in wound dressings, creams, and as an antibiotic coating on medical devices.
≡ Silver is an active ingredient in medical products as it prevents bacterial growth and accelerates the healing process, making it a component of certain antibiotics.

MANGANESE
≡ Manganese is required for the normal functioning of the brain, nervous system and a number of enzyme systems.
Other Useful Elements

**GOLD**
≡ Gold complexes such as auranofin are used as a medication of rheumatoid arthritis.

**IRON**
≡ Iron-deficiency anaemia is a serious world-wide public health problem, especially in women and the chronically-ill.
≡ Iron fortification programs have been credited with improving the iron status of millions patients.

**ALUMINUM ACETATE**
≡ Aluminum Acetate is used to treat inflammation, itching, and stinging of the infected skin. It also promotes healing.