PROTEIN INGREDIENT MARKET

Science Market Regulation

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SCIENCE – MARKET - REGULATION

This comprehensive report is based on in-depth interviews with food companies completed by a desk review.

It provides for DECISION MAKERS a global understanding of the sector as well as an outlook on its future.

New trends and perspectives

Sales by country and ingredient category

Production volumes by country

Suppliers

Users

Dairy products & Ice creams
Nutrition, Infant formula
Dietetic & Sport & Slimming foods
Confectionery & Chocolate
Beverages
Meat, ready-to-eat food
Clinical Nutrition

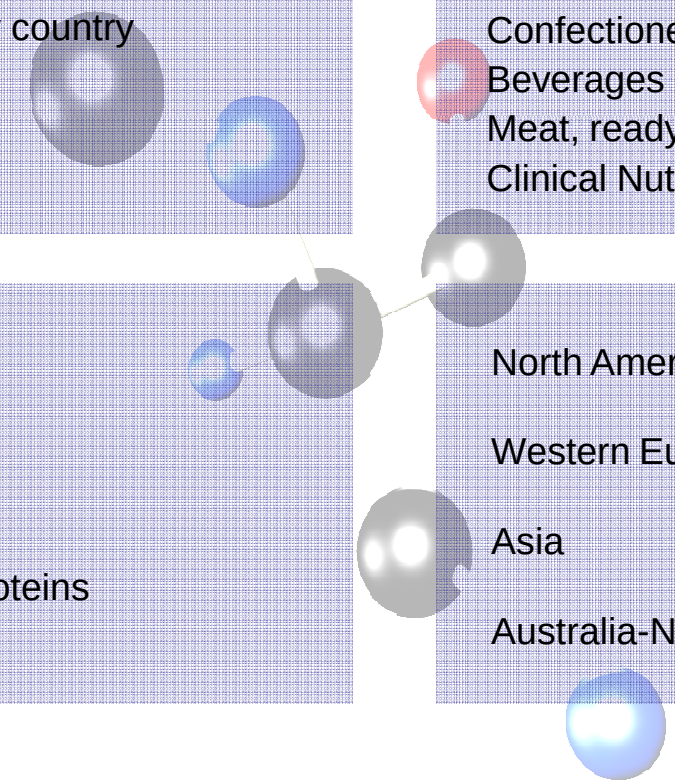
Wheat protein
Egg protein
Soy protein
Vegetable proteins
Whey proteins
Meat protein, Fish proteins
Protein Hydrolysates

North America

Western Europe

Asia

Australia-New Zealand



INTRODUCTION

OBJECTIVES MARKET

Consumption trends by segments

Volumes of proteins used by type and by segments

Criteria of choice of food companies

Proteins are assembled from their basic unit amino acids; about 20 to 22 amino acids are commonly found in proteins. Amino acids are classified into essential and non essential. There are nine essential amino acids required in the diet. As the human is not able to synthesize those amino acids they must come from the food.

In the anabolic process amino acids are linked together into body proteins which are constantly synthesized and degraded for energy recovery, cellular structure, enzymatic processes, antibody formation, blood-clotting factors, neurotransmitters, etc.

Proteins are used either for their nutritional value or their functional properties. Everybody needs food proteins. The amounts needed depend on one's body size, metabolism and period of life (growth, pregnancy, etc.)

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Extra protein beyond the daily requirement will not make extra muscle or grow hair faster or protect against diseases. Protein beyond what is needed is either broken down and used for energy or it is stored in fat cells. A too low protein diet will result in a gradual breakdown of body tissue protein, loss of muscle mass and metabolic disorders.

Proteins have different level of biological activity in the body. The main methods of evaluation are biological value and net protein utilization and protein digestibility corrected amino acid score (PDCAAS). Milk, eggs and meat are considered as the most valuable sources as they contain all essential amino acids. Egg white has a biological value of 100 which means that all the nitrogen from eggs can be used by the body. Plant proteins usually have a lower score (70 for corn).

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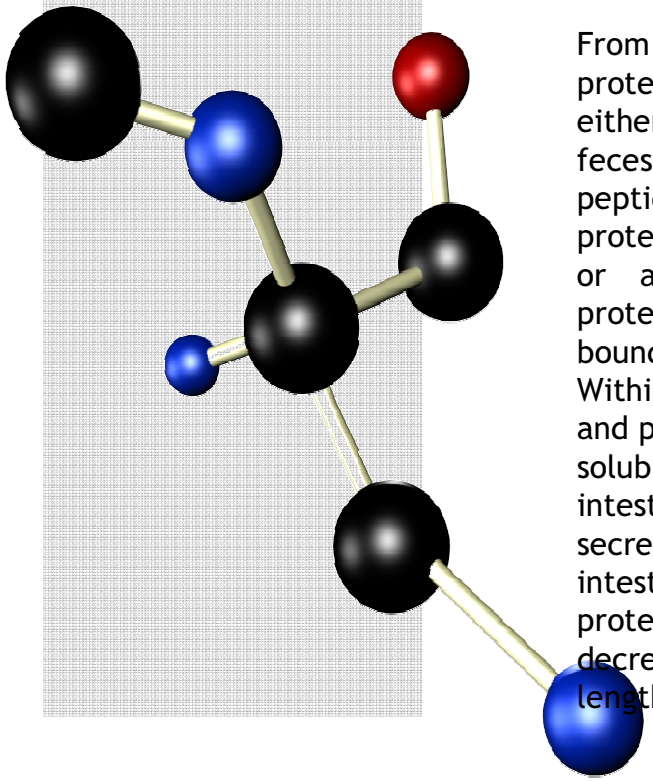
BIOACTIVITY OF PROTEINS

During digestion, proteins are broken into amino acids and small peptides. Intact proteins are, for the most part, not absorbed across the gut wall. One exception would be a special class of milk-borne immunoglobulins (IgA) that are specifically absorbed and provide passive immunity to newborns and babies. A second exception is that very low levels of intact proteins or large fragments of proteins are taken up by mononuclear leukocytes, possibly through macropinocytosis, as part of the immune system surveillance of gut contents.



From a nutritional perspective, proteins are typically classified as either non-digestible (excreted in the feces) or digestible (absorbed as small peptides and amino acids). Digestible proteins are largely soluble in water or acid whereas the indigestible proteins are typically insoluble, being bound primarily to sugars or fiber. Within the stomach, hydrochloric acid and pepsin denature and fragment the soluble proteins. Later in the small intestine, protein-digesting enzymes secreted by the pancreas and intestinal wall further break down the protein chains into peptides of decreasing size, typically ranging in length from a few hundred amino acids down to the component individual amino acids and extremely short peptides (two to six amino acids).

A study published by Robert et al (1999) demonstrated that the bioavailability of peptides was inversely proportional to the length of the AA chain. The digestive tract provides a strong barrier to macromolecules and all non essential AA are converted into carbon and nitrogen, as a source of energy or urea.

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THE MARKET

The global proteins ingredients market is estimated at about $10 billion. Proteins today are essential in nutritional sectors. The animal-derived protein market is now challenged by plant-derived proteins due to price differences and fluctuations but also consumer attitudes particularly as consumer are more convinced of the nutritional benefit of plant proteins. Soy protein represents a very competitive product in terms of price.

Its main market sector is the meat industry. Wheat proteins are mainly used in the baking food sector. This is still a small market but with an increasing number of applications. Dairy proteins still represent the main market and have a wide range of food applications. Meat protein represents the last category of products and has very important volumes.

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APPLICATIONS

Market Sectors for proteins:

Dairy products / Ice creams
Infant formula- Clinical nutrition
Dietetic products & Sports Food
Confectionery & Chocolate
Beverages
Meat/pigmeat, ready-to-eat food
Bakery / Biscuits/ Snacks

TYPE OF PROTEIN

Wheat protein
Soy protein
Other vegetable proteins
Whey proteins
Meat-Fish proteins
Hydrolysates

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METHODOLOGY

Quantitative

Volumes of different types of proteins broken down by geographical market

Type of proteins broken down by market segment

Qualitative

Main usage of each protein source

Comparative advantage of protein sources

Receptivity of different market segments and usage of protein sources

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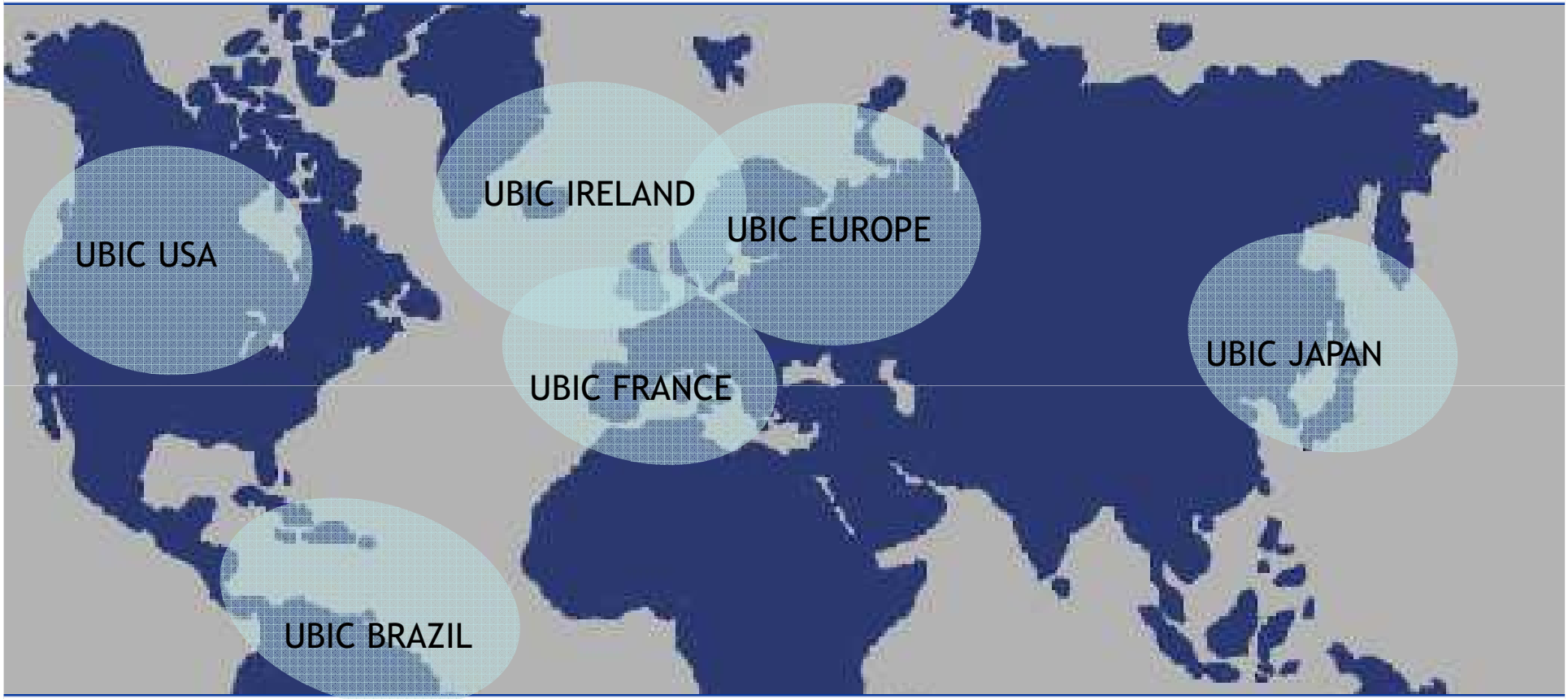

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