Bone and joint health: a promising market, World of Food Ingredients, Janvier 2013

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Impact of population aging on bone and joint health

The world population is aging and this phenomenon has several economic and social consequences. For instance in Europe, **the median age will increase from 37.7 in 2003 to 52.3 by 2050**. Moreover, 50% of the Europeans will be over 60 years old in 2050. As a consequence, countries around the world are witnessing an alarming rise in chronic diseases and **50% are due to bone and joint related diseases**. Indeed, osteoporosis and osteoarthritis are common complications.

Osteoporosis

According to the International Osteoporosis Foundation, more than **200 million people are affected by osteoporosis worldwide**. The prevalence has increased since 2003 and will continue to grow by about 3% per year. The disease affects 4.5% of men and between 18 and 25% of women over 50 years old. In the US, osteoporosis affects nearly 44 million Americans and **80% of them are women**.

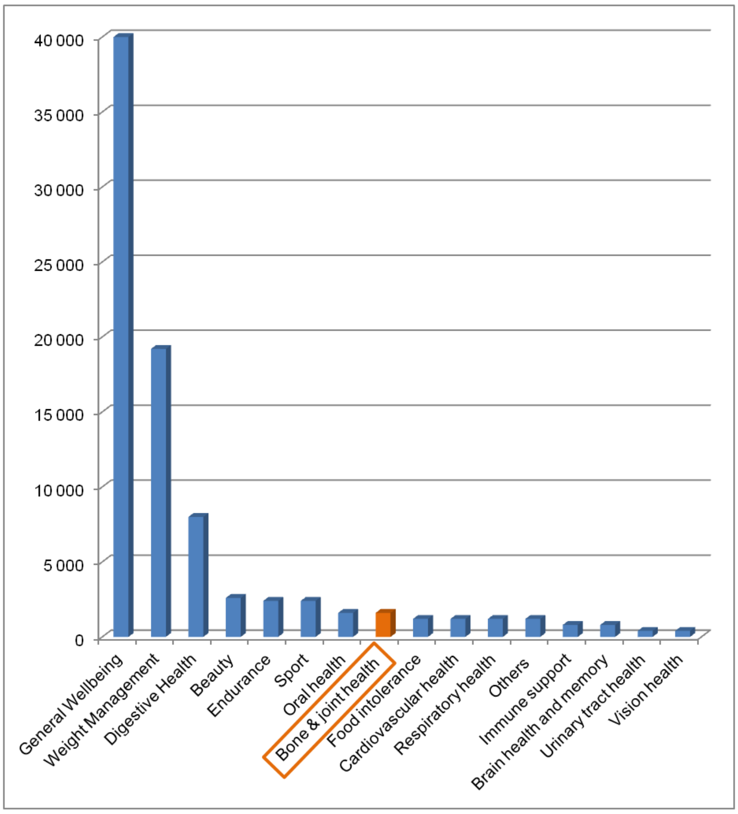
Osteoarthritis

1 out of 3 persons between 45 and 64 years-old suffers from osteoarthritis. 80% of those will be limited in their movement and 25% will not be able to perform their major daily life activities.

These numbers continue to rise as the world population ages but also getsmore overweight and sedentary. Indeed, increasing prevalence of early osteoporosis and osteoarthritis are **linked to obesity rise**.

A high-growth market

The global bone and joint health market is estimated to be worth $1.6 billion and recent forecast predicts that it will exceed $9 billion by 2017. This sector will experience a steady gain in the coming years. For the moment, bone and joint health is the **8th most important health** segment as far as functional foods and supplements are concerned.



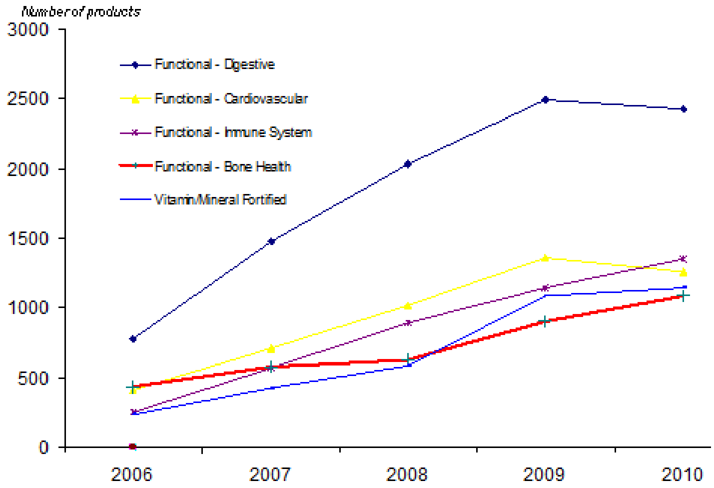
Segment health market for functional foods and supplements (US$ million)

Source: Finding the sweet spot of nutricosmetics – In Cosmetics – 2012

Today, **the most important bone and joint health market is the US** because of the aging Baby Boomers. For instance, the US ingredient market fort bone health was estimated to be worth $178 million in 2008 and is expected to reach $246 million by 2015. **Asia is the second largest market,** largely spurred by China and Japan. It is noteworthy that Asian and Caucasian women are more prone to bone and joint diseases.

The elderly is obviously the n°1 target for bone and joint health markets because seniors are the most concerned by these problems and the most likely buyers of dietary supplements and functional foods. However, **childhood and adolescence are also interesting and important targets** because they are critical times to optimize bone mass. About 85-90% of adult bone mass is acquired by 18 years old for girls and 20 years old for boys. It is important to build strong bones during childhood and adolescence to help prevent osteoporosis later. Improving children's health is possible thanks to diet and industrials should look deeper into this target.

Safety and efficacy of supplements and other products remain a critical factor in determining long-term success of the category. **The number of functional products with bone health claims has doubled between 2006 and 2010,** whereas heart and digestive health claims have experienced a slowdown of their development.



Functional product launches by claim between 2006 and 2010

Source: Current and future trends in bone & joint health – Leatherhead Food Resarch – 2012

Market drivers and barriers

Population aging and obesity development are obviously driving the market. But today consumers expectations are also key drivers.

Live longer and better

Even if bone and joint health are often perceived to be nonfatal health issues**, people in this aging population want to stay active as long as possible**. That is why consumers awareness of joint health is increasing and driving the market. It went from 38% in 2005 to 49% in 2010. Consumers are looking for ease of movement and joint comfort. This desire is driving the demand for joint health products, preferably easy to take and with measurable benefits. On the other hand, according to a Health Focus study in 2008, bone health and strength is a top health concern for 61% of survey respondents.

The boom of natural products

Looking for more natural and comfortable ways to continue daily life activities is a global trend. Because of medical solutions with side effects on long term therapy, consumers are turning to natural health supplements as they offer greater health benefits in comparison to artificial supplements. More and more industries are escalating interest levels in natural innovations, ingredients and products which promote and support bone and joint health.

A strict regulation

In Europe, regulation on health claims can restrain innovation. Indeed, only vitamins and minerals have obtained authorized health claims about bone or joint health. Emblematic ingredients such as chondroitin sulfates have unfortunately obtained negative opinions for claims on joint function so far, which means that they can no longer be linked to these health claims in public communication. However, **some industries have decided to consider this new regulation as an innovation opportunity rather than a barrier.** One innovation strategy is to **associate innovative plants or extracts with vitamins or minerals** in order to be able to claim. Nevertheless, authorized claims sometimes lack intelligibility (e.g "Vitamin C contributes to normal collagen formation for the normal function of cartilage") which means that they will have to be re-written while staying in the regulatory field. Pharmaceutical and food companies will have to find smart ways to communicate on their products promises. **In that case, innovation lies in communication.**

Focus on ingredients for bone and joint health

Bone health ingredients

The star ingredients for bone health are obviously vitamins and minerals, which effects on bone mineralization are no longer to demonstrate. Nevertheless, ingredients suppliers keep innovating and offer **new sources of vitamins and minerals**.

For instance, highly absorbable calcium from eggshell or from fish scales can be found. Algaemin commercializes **calcium from algae** which is supposed to be more effective than synthetic calcium. They claim that, better than just slowing down bone demineralization, AlgaeCal® can help increase bone mineral density within 6 months or one year.

Vitamin D used in dietary supplements or food is most of the time synthetic. Some industrials (e.g. Lallemand) now offer natural vitamin D, which is in fact **vitamin D rich inactive yeast**. Indeed, some yeast strains can turn ergosterol into vitamin D under UV light. Beyond being a natural source of vitamin D, the interest of inactive yeast is that it also contains readily assimilated proteins including all essential amino acids, dietary fibers, minerals, and B Complex vitamins.

Vitamin K is less known than vitamin D but is also important for bone health because it is necessary for calcium fixation. **One natural source of vitamin K is Natto**, a typical Japanese dish for breakfast, made of fermented soy beans. Natto is a highly interesting source of vitamin K7 because it has a greater bioavailability and bioactivity compared to other sources of K vitamins. As a result, natto helps efficiently preserve bone mineral density.

Joint health ingredients

The joints ingredients market is evolving. **For a long time, glucosamine and chondroitin sulfates have supported this segment**. Many ingredients suppliers (e.g. Gelita, Rousselot) offer cartilage extracts from bovines or poultry, but a growing number (e.g. Copalis, Aroma NZ) now extract glucosamine and chondroitin sulfates **from marine sources** (shark, stake…) because it has a better image for consumers. Nevertheless, all scientific studies on glucosamine and chondroïtine sulfates are not unanimous. More studies proving the long-term enhancement of the joint structure with glucosamine and chondroïtine sulfates are still needed.

These scientific expectations, together with the negative EFSA opinion about glucosamine and chondroïtine sulfates, have made room for new ingredients.

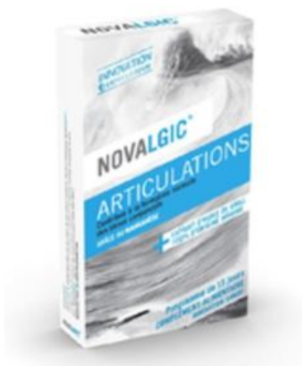
Two plants in particular have become very popular: **harpagophytum and rosehip**. Both contain molecules which could inhibit some inflammatory processes. Some other plants with anti-inflammatory properties could also be of interest, especially **blackcurrant, mangosteen and curcuma.** Meriva® is an example of curcuma extract standardized with 20% of biodisponible curcumin. Two clinical studies have shown that consumption of Meriva® by osteoarthritis patients improves walking performance and significantly reduces inflammation, pain and leg stiffness.

Another growing active used for joint health is **krill oil**. Indeed, krill oil contains omega 3 (EPA and DHA) but also antioxydants (astaxanthin, vitamin A and E). Neptune has shown through a clinical study that consumption of krill oil can reduce inflammation (C-reactive protein) and pain in osteoarthritis patients. **Astaxanthin from microalgae** (e.g. Haematococcus) could also be a natural anti-inflammatory solution with no side effects.

Focus on finished products for bone and joint health

Dietary supplements

In Europe, the joint health market is dominated by dietary supplements. Nowadays, dietary supplements targeting joint health make good sales, mainly thanks to their **quick relieving effects**. For instance, Novalgic®, a Sanofi Aventis product sold in France, contains krill oil associated with vitamin C and manganese, two nutrients with authorized claims about respectively collagen and connective tissue formation. The launch of Novalgic® in 2009 is a perfect illustration of the growing interest of large pharmaceutical companies for health and seniors dietary supplements.



Concerning the bone health supplements, the market is not in good shape in Europe. As noticed above, consumers are looking for benefits they can quickly feel. And yet, products targeting bone health with calcium and vitamin D or K have no visible effects. Moreover, people with bone problems such as osteoporosis usually take drugs on medical prescription rather than dietary supplements.

Functional drinks and foods

According to Innova Database, foods and drinks targeting joint health accounted for less than 1.5% of global launches in 2011. USA and Asia are the two most active zones in this field, Europe being a little lagged.

In the USA**, drinks enriched with chondroitin and glucosamine sulfates** are appreciated to relieve joint pain. One emblematic product is Elations®, a soft drink launched in 2008, which contains 1500 mg of

glucosamine, 1200 mg of chondroitin, calcium and boron. It is claimed that the ingredients are “More absorbable than pills”. Nevertheless, industrials still remember the quick withdrawal of Coca-Cola pioneer product Minute Maid Active® in 2007 and stay careful concerning innovation.

Dairy products

Dairy products are good vehicles of health claims about joint and bone health. Indeed, they have a healthy image and are known to be good for bones thanks to their natural content of calcium. That is why many functional foods or drinks for bone health are often dairy products.

Nevertheless, in France most of launches of dairy products for bone health before 2010 have failed. Two examples are Danone Calci+ and Densia. These failures can be explained by the fact that consumers did not see the interest of paying more for a product which do not bring additional benefits (dairy products are already known to be good for bone health). **Yoplait Calin+ has succeeded in penetrating the market thanks to a strong communication campaign** explaining the importance of increasing calcium and vitamin D intakes. Calin+ especially targets menopausal women who do not eat enough dairy products and looks and tastes like a classic yoghurt.

In Asia, **the expert of bone nutrition is Fonterra** with its brand Anlene® which offers a range of calcium enriched dairy products. They have twice as much calcium as regular products and are also enriched with vitamin D and other minerals. Their effect on osteoporosis and their interest in prevention have been proven by 18 clinical trials. **This scientific caution appears on pack (“clinically proven”) and seems to please consumers.**

As noticed before, the elderly are the main target of dairy enriched products. **To fulfill the expectation of catering for seniors**, some food companies have launched a range of products specifically adapted to elderly. For example, the famous French cheese La vache qui rit® now has a senior version with 900 mg of calcium instead of 610 mg for the classic product.

Conclusion

With a growing number of seniors who want to live longer and better, the bone and joint health market is promising. Ingredient suppliers keep innovating in this field despite the restrictive regulatory context in Europe and offer natural and efficient ingredients which can meet consumers’ expectations. As far as finished products are concerned, Europe is still lagging. Functional drinks for joint health might find in the next years the same success in Europe as in the US or Asia. Dietary supplements targeting joint health are appreciated by consumers

because of their quick relieving effects and natural image, but as far as bone health is concerned, consumers prefer enriched dairy products.

About Nutrikéo Consulting

Nutrikéo is a consulting agency specialized in MARKETING, INNOVATION STRATEGY and COMMUNICATION for the nutrition and health business (functional foods, dietary supplements, nutritional ingredients).

Among its large panel of services (to discover on www.nutrikeo.com), it helps companies to find alternative communication strategies to the regulation context through its offer Opticlaim (www.opticlaim.fr).

To benefit from our expert vision, follow our blog: www.culture-nutrition.fr.