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Editorial

The unique "Taste" of the Vitagora® network.

As our network grows on a national and international scale, Vitagora® continues to create closer links and form surprising partnerships between complementary sectors.

What a road we have been down the last 3 years since Vitagora® was created on the July 12th 2005. On the occasion of our 3rd birthday, it is the chance to take stock of our accomplishments and review our objectives.

As far as our accomplishments go, there is sufficient to feel proud, the successful organization of the 3rd International Taste-Nutrition-Health Congress (400 participants of 15 nationalities) in April for a start, during which a genuine and relevant link was established between academic research and potential industrial applications.

In addition, along with our network of companies, public and private research institutions and training establishments, our international reputation is growing, as was amply demonstrated by the warm reception of the delegation of Vitagora® members who visited four countries in South-East Asia at the end of May. The response has been overwhelming both for the Cluster and its individual players. Commercial and technological collaborations are already underway and less than a month after returning from Asia, Vitagora® will be hosting a delegation of Thai researchers interested in a collaboration in the area of active packaging.

Still on the subject of active packaging, the latest wave of innovative projects launched by Vitagora® includes the project EMAC, with new additions to our skills network. Vitagora® has long encouraged thinking outside the box in order to strike up unlikely but fruitful collaborations, and this project represents new ground for our cluster as it is a tripartite joint project between Vitagora® and two other French clusters of complementary sectors: one specialized in plastics and the other in non-food agro-materials.

And therein lies one of the major objectives of our cluster: to create links and encourage mutually beneficial collaborations between homogeneous partners, whether in terms of sector (private industry or public research), industry division (food, health, materials etc.) or geographic location. Find out for yourself the new perspectives the Vitagora® network can open for you.

Pierre Guez
President
Vitagora® Taste-Nutrition-Health

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VITAGORA®
Pôle de Compétitivité **Goût-Nutrition-Santé**
*The **Taste-Nutrition-Health** Competitive Cluster*

Asia Group Visit: "The results have far exceeded our expectations"

Having grouped together the essential components on a local level – world-class research facilities and training institutions, competitive and dynamic companies –, as well as launching cutting edge innovation projects, clusters are nonethelss all faced with the same problem: how to become known outside of their geographical area. The era of the internet has of course enabled rapid communications but crossing borders remains a difficult exercise, all the more so in the face of the added competition created by globalization. In this context, the collective international visits centered around the Vitagora® Taste-Nutrition-Health Cluster are proving an effective tool. In 2008, Vitagora® is planning at least two of these, the first of which took place in Asia at the end of May. Christophe Breuillet, Director of Vitagora® declares that the results of this first collective visit have "far exceeded our expectations".

The preparation for this visit has been particularly intense. "*Several regional, national and international government agencies (the Burgundy regional government and the French trade commission, for example) have been assisting us,*" explains Christophe Breuillet. "*With their help, prior to our visit, the profiles of the eight organizations taking part in the visit were sent to the various people we were meeting, just as we received their profiles. This has proved to be essential in enabling us to use our time in each country as efficiently as possible.*"

Four countries were included in the two week trip: three days in Singapore, four days in Thailand, three days in Vietnam and the final three days in Japan. Most of the delegation's participants had, however, little first hand knowledge of the economic and scientific context of the countries visited. "*We were very surprised by the potential, not only in terms of business but also in terms of the number of scientific and technological collaborations that were discussed for the coming months or years,*" says Christophe Breuillet.

Collaborations underway

During the Asia trip, the members of the delegation were able to visit world-class research centers in the areas of nutrition and biotechnologies, make contact with local companies, as well as having meetings with representatives of various government ministries (health, industry or agriculture) and higher education institutions. This was also the chance for the visitors to gain an idea of the image of France and their regions in the eyes of the locals. "*It was a humbling experience*", says Vitagora®'s Director. "*We were able to see that Burgundy and Franche-Comté are really very small dots on a world map.*"

Overall, the discussions between visitors and locals have proved rich and mutually profitable. Indeed, a group of

From left to right: meeting with a food research institute; the delegation meets with Thai researchers; Vitagora®'s booth at the IFIA "Healthy Foods" trade show in Tokyo.

A food market in Bangkok.

researchers from a Thai laboratory have already indicated their interest in collaborating with Dijon-based research teams in the area of Active Packaging. Following the exchanges in Thailand, these researchers will be making a reciprocal visit to Vitagora® in the coming months.

Vitagora®'s delegation also took part in the IFIA Japan "Healthy Foods" trade show in Tokyo which allowed multiple contacts with Japanese companies. "*We were looking to identify potential partnerships, whether commercial, scientific or technological.*" During the show, the delegation held a conference for an audience of 50 or so representatives of companies and technical centers.

Different expectations for each country

For Vitagora®'s Director, this business trip has enabled the cluster to gain a clear view of the strengths of each country, their expectations regarding the Taste-Nutrition-Health Cluster and their interest in establishing partnerships and joint projects. In the case of Singapore, the locals were enthusiastic about working with the Cluster's members in the areas of nutrition and prevention of metabolic diseases. In addition, this country was identified as an ideal platform for companies seeking to launch into Asia. Thailand, on the other hand, was home to a significant R&D infrastructure housed within scientific university campuses and with a market interest in the areas of nutrition and cancer.

In Vietnam, one of the key problems is malnutrition, especially regarding children. "*The locals that we met were interested in how our expertise could help them tackle these problems, perhaps via developing functional products for children,*" explains Christophe Breuillet. "*Japanese researchers have also expressed a great interest in the projects developed by Vitagora®, in particular those of the research teams based in Dijon. They are also very interested in taste and the sensory, which is an emerging area of study in this country.*" Consequently, in Japan scientific partnerships are being discussed in a number of key areas such as taste-sensory and the relationship between nutrition and cancer.

Consolidating partnerships

The highly encouraging results of the Asia trip are a boost to the plans for other international trips planned for 2008 and the next two years. A delegation will thus be visiting the United States at the beginning of July. "*Of course we are looking at a number of other destinations for 2008-2010, for example Canada, Australia and New Zealand. But our first objective is to consolidate contacts with the countries we have just visited, by returning there or extending invitations to come to France for the representatives we met, perhaps for the 4th installment of the International Taste-Nutrition-Health Congress in 2009,*" says Christophe Breuillet.

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The delegation at Biotec (National Center for Genetic Engineering and Biotechnology) in Thailand.

Vitalim'Senior: Functional food for the elderly

Recently selected for funding by the *Fonds Unique Interministériel* (French Government agency dedicated to funding industrial R&D projects), the project Vitalim'Senior, accredited by Vitagora®, aims to develop functional foods – food products claiming a specific health effect – in the form of dairy-based desserts and drinks, to help treat excessive weight gain in the elderly. This innovative project brings together two Burgundy and Franche-Comté based companies, Senoble and Canéo, as well as several laboratories specialized in cellular metabolism (Exichol, Lara Spiral and the Unit 866 of INSERM*) and should end in about 3 years with the launch of a number of new products.

It was natural for Senoble to find a way to be present in the market of functional foods. In order to do so, this leader of the French market for dairy-based desserts was in need of the necessary expertise to ensure the quality of the health claims of its products. Within the Direction of Innovation, Quality and Industrial Strategy, headed by Patrick Falconnier, Senoble has thus created a small team dedicated to the specific task of developing functional foods. Hence the launch of the project Vitalim'Senior with the help of Vitagora®. *"Of course the company saw a market opening, but we probably wouldn't have launched this project so quickly without the input of the Vitagora® Cluster, which allowed us to find the necessary partners to develop the project,"* says Patricia Ramos, Scientific Manager of this team in Senoble.

Two areas of research

In order to develop functional food products for the elderly, Vitalim'Senior is organized around two areas of research: the first area concerns a family of active ingredients developed by the Swiss company Exichol, who recently announced their decision to set up in Dijon. These ingredients should enable body fat accumulated in the adipose tissue to be used up by the metabolism. The second area of research aims to discover if maintaining levels of antioxidant activity, which reduces the effects of aging, could have an effect of weight gain. *"We will be using a second type of active ingredient developed by the Dijon-based laboratory Lara Spiral,"* explains Patricia Ramos.

Senoble: portrait in numbers

This 100% family-owned company was created in 1921 by Sophie Senoble. It is today France's 3rd largest producer of chilled dairy products and is a leading manufacturer of supermarket own-brand products.

- 1,500,000 liters of milk processed per day
- 573,000 tons of products made in 2006
- Revenue: 809 million Euros in 2006
- Export: 46% of revenue
- 2,400 employees
- 11 production sites (5 in France, 1 in Spain, 2 in Slovakia, 3 in England)

Both Senoble and the second partner, Canéo, a SME that manufactures plant-based non-alcoholic beverages, have a similar approach based on the use of natural ingredients with proven consumer health benefits and no side effects. The products developed by this project will therefore contain only cocktails of natural ingredients at low doses. *"The active ingredients that we have selected will be exclusive to the type of applications we are envisaging, this being the originality of the products we are eventually looking to market,"* underlines Patricia Ramos.

Scientific testing and clinical studies

The real launch of the project will take place during the second half of 2008. For the first two-year phase the "Lipid-transfer proteins and lipo-protein metabolism" research team, directed by Laurent Lagrost in the Unit 866 of INSERM*, will carry out preliminary studies. The second phase will consist of a fine-tuning of the products at a prototype and industrial stage, as well as carrying out the necessary clinical studies with the help of the Dijon Gerontopôle, a center dedicated to studies focusing on the elderly. The industrialization phase will also be supported by a market study. The aim is for these products to be ready for launch around 2011 or 2012.

**Institut National de la Santé et de la Recherche Médicale* – the French national medical research institute

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Sensory training sessions for children: EDUSENS publishes its first results

Could sensory training be a useful tool for improving the dietary behavior of children? In the context of the worrying increase in childhood obesity, the hypothesis of Edusens, a nationally funded research project accredited by Vitagora®, is currently being put to the test in 3 successive experimentations carried out in the classroom, in school cafeterias and, finally, in the home.

Each of these experimental phases involves around 200 children aged 8-10 years old, who come to the European Centre for the Sciences of Taste (CESG*) to carry out tests of food preference and dietary behavior. Consisting of measuring the ability to categorize and describe the sensations perceived while eating, as well as evaluating the food preferences and choices of the children for several types of products, these tests are carried out before and just after sensory training sessions. The tests are repeated a third time 6-9 months after the training sessions in order to evaluate how long-lasting the observed effects are on the children.

The first phase of experiments has recently come to an end, allowing the researchers† of Edusens to obtain a first set of results that were presented in June by Caroline Reverdy for her doctoral thesis. These results were also published in the journal *Appetite* in an article titled "Effect of sensory education on willingness to taste novel food in children" co-authored by C. Reverdy, F. Chesnel, P. Schlich, E.P. Köster and C. Lange. *"These results have revealed that sensory training does indeed change children's eating habits. We were able to observe a reduction in neophobia, the fear of tasting unfamiliar food. However, there is as of yet no confirmation that these effects are long-lasting following the end of the sensory training sessions,"* explains Pascal Schlich, the director of LIRIS (the Research-Industry-Sensometry Interface Laboratory of the CESG) and coordinator of the Edusens program.

"It is certain that sensory training, starting at a young age, improves eating habits. However, by itself it does not prevent dietary pathologies that we, as a society, are facing. That said, if we are able to limit neophobia, a stage that children go through between the ages of 3 and 6 and sometimes beyond, this will already be progress," says Pascal Schlich. The final report on all three stages of the project is planned for publication in February 2009.

**Centre Européen des Sciences du Goût*

†This project involves researchers from the CESG, UMR FLAVIC (*Flaveur, vision et comportement du consommateur*), Faculty of Medecine of Dijon, l'*Institut de Recherche en Science de l'Education*, l'*Institut du Goût*, AgroParisTech, University of Utrecht.

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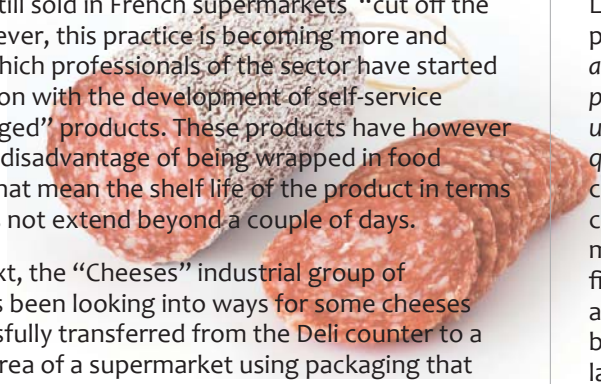
EMAC: developing Active Packaging for agri-business

The first Vitagora® project to be co-accredited with two other French clusters, EMAC is also the project with the largest budget to date: 5.5 million Euros. With a program planned over 3 years, this project should start as early as the beginning of 2009. Concerning an area of research that is a hot topic at the moment on a worldwide level, EMAC aims to develop active packaging solutions that improve the preservation of taste qualities of dairy and meat products and lengthen product shelf life. With the international dairy industry group Lactalis as project leader, several other manufacturers and laboratories are also involved in this collaborative project.

Many traditional cheeses, in particular those of Burgundy and Franche-Comté (such as Epoisses, Chaource or Comté) are still sold in French supermarkets "cut off the block". However, this practice is becoming more and more rare, which professionals of the sector have started to capitalize on with the development of self-service "fresh packaged" products. These products have however the principal disadvantage of being wrapped in food grade films that mean the shelf life of the product in terms of taste does not extend beyond a couple of days.



In this context, the "Cheeses" industrial group of Vitagora® has been looking into ways for some cheeses to be successfully transferred from the Deli counter to a self-service area of a supermarket using packaging that retains the taste characteristics of the original product. The companies state their aim: "*If we manage to guarantee the shelf life of these products for 20 days, the necessary logistical and commercial networks are already in place to enable a national or even international distribution of these products*". The first step towards the creation of an active packaging solution.

3 clusters on one project: a first for Vitagora®

It is from this situation that the project EMAC had its beginnings and now groups together 3 companies of the dairy and meat product sectors (Lactalis, Chazal and Salaisons Dijonnaises), as well as the companies AFT Plasturgie, Wipack and Plastilax (Lacroix group). A number of research units and laboratories are also involved such as the CRITT 2ABI and ENSBANA (University of Burgundy). "*Everything started from the observation made by the engineers of AFT Plasturgie, a Dijon-based SME working in the area of composite materials primarily destined for the automobile industry,*" explain the representatives of Lactalis. Indeed, AFT Plasturgie's engineers noticed that agro-sourced composites, in this case hemp, combined with plastics presented interesting properties in terms of absorption and release of molecules.

A feasibility study was then carried out by the CRITT 2ABI in order to verify these properties, at which point Lactalis became interested in launching a joint research project. "*Lactalis had just launched a new active packaging application for our camembert involving a micro-aerated permeable membrane that solved the problem of unpleasant fridge odours all the while guaranteeing the quality of the product for a longer period,*" explains the company. The French clusters, Plastipolis (plastics and composites) and IAR (non-food applications for agro-materials) then became involved alongside Vitagora®, the first time the Taste-Nutrition-Health cluster had developed a project with a 3-fold accreditation. EMAC has recently been submitted for national funding with a provisional launch date of January 2009.

The urgency of launching this project is all the greater for the large amount of interest generated worldwide by the topic of packaging, this being generally regarded as a key area of competitiveness. "*In the US, several research teams are already working on completely biodegradable packaging. At our end, we decided to explore the area of the functionality of packaging. However, we are not rejecting all possibility of also looking at 100% biodegradability in the future,*" say the project partners.

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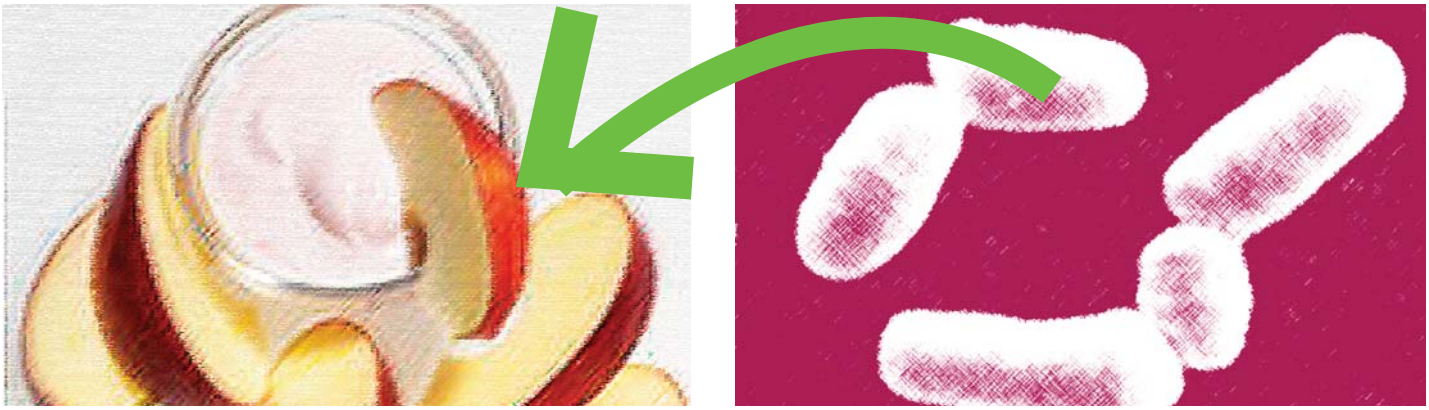

Optimizing the effects of Probiotics

We call them probiotics. What they are is living microorganisms, present in fermented food products or marketed as dietary supplements that, if ingested in sufficient quantities, can have beneficial effects on the host's health. If probiotics have rapidly become a market fixture, for example in such products as Actimel or Activia, there is significant progress to be made in the technological application of these fragile strains of bacteria and yeast. Therein lies the basis of the project "Probiotics" of Vitagora®, bringing together the companies Senoble and Merck Médication Familiale.

The functional effectiveness of probiotics is one of the major preoccupations of food manufacturers using them in their products, whether in fermented dairy products or as dietary supplements. "*We are all facing the same problems of technological applications of probiotics. For the most part, they are very sensitive organisms. It is important for Senoble to better understand the parameters that can improve or reduce their functionality,*" explains Patricia Ramos, Scientific Manager of the Innovation, Quality and Industrial Strategy department of Senoble. These preoccupations are shared by Merck Médication Familiale, manufacturer of dietary supplements, the second partner involved in the joint project baptized "Probiotics".

Three doctoral theses for the project

Accredited by Vitagora® and submitted for national funding (results expected in July 2008), Probiotics is a major project for the two companies partnered in the undertaking. "*It is one of those projects that is absolutely necessary for our company,*" explains Patricia Ramos. The project will also make use of the scientific and technological expertise of two large public research laboratories specialized in the areas of physiology of the digestive system and food professing.

A total of three doctoral theses will also be carried out during the 3-year program of the project, the first two being funded by the project leaders and the third with national public funding. "*One of the main points of this project concerns improving functionality and viability of probiotics during the various stages of manufacturing that the microorganisms have to survive. In parallel, we are going to put two areas of the health effects of probiotics under the microscope,*" says Patricia Ramos. But the rest is a jealously guarded secret. Proof that probiotics, even though already present in a number of ground-breaking products, have a long way to go in terms of exploiting fully their remarkable potential. The race is on for a number of major industry players to be the first to do so.

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The CRITT 2ABI equipped with new "Sensory" transfer department

The CRITT 2ABI is a food industry technology transfer center based in Dijon who has provided services to European food manufacturers for 20 years in the area of food technology transfer, in particular food processing involving texturization by thermo-mechanical treatment and industrial microbiology. Since the end of 2007, the CRITT 2ABI also has added a new string to its bow with the creation of a "Sensory Transfer" department.

Already experienced in the area of the sensory thanks to their expertise in food texturization, this center has further strengthened this area and added a new range of services to their list. This service offer is all the more attractive for having the support of the heavy weights of sensory research based in and around Dijon such as the CESG and the FLAVIC research unit. Covering all food industry sectors, from the selection of raw materials to the evaluation of their sensory properties, the CRITT 2ABI is able to respond to specific industry needs through either tailored training sessions or industrial technology transfer. "*Our training programs combine theory classes and practical workshops in order to give our students the full benefit of our expertise. As is often the case, former students then become clients for R&D contracts,*" explains Patrick Gervais, Director of the CRITT 2ABI. "*We have already started several new contracts focusing on the sensory aspect.*" This new department will also have the use of a new "Sensory" wing of the CRITT 2ABI's existing Technology Hall, a 1,200 m² space containing experimental and prototype food processing equipment.

Having been a founding member of Vitagora®, the CRITT 2ABI remains very involved in its development. Patrick Gervais is indeed the coordinator of the "Development, Process, Industrialization" skills platform of the Cluster. "*The creation of Vitagora® has had a hugely positive effect on the activity of the CRITT 2ABI,*" he affirms, "*through the added visibility for locally based expertise, as well as the Cluster's role in initiating and launching projects that make the best use of that expertise.*"

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The Food Technology Hall of the CRITT 2ABI in Dijon.

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