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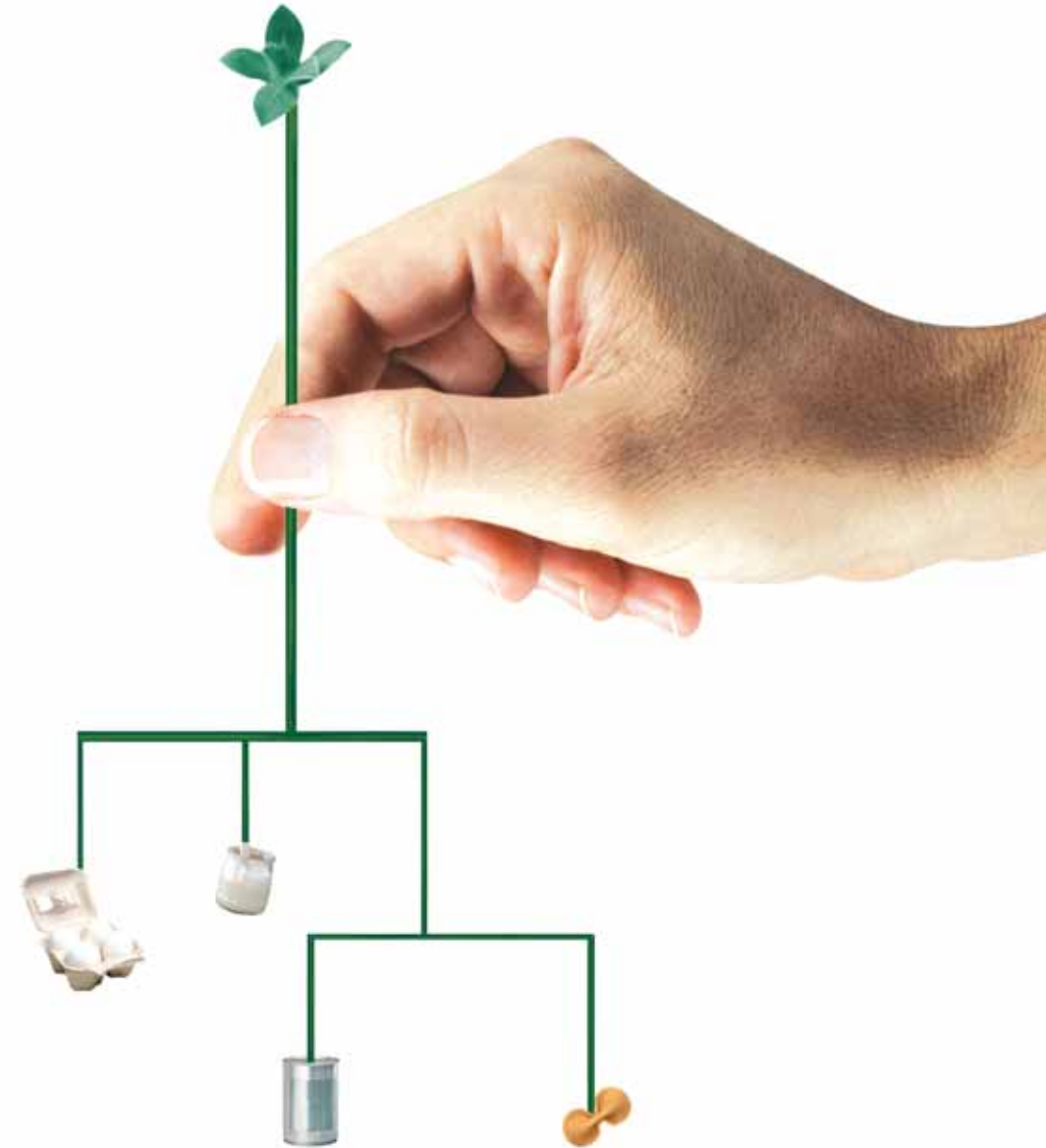


ADEPTA, a professional group of 220 French agrifood businesses (equipment suppliers, input suppliers, experts, research institutes, engineering, firms, and more) promotes French industrialists abroad and helps them find new export outlets. Established in 1977 with support from the French Ministry of Agriculture and Fisheries, ADEPTA is backed by the public authorities and is part of the public support system to foreign trade. ADEPTA: association pour le développement des échanges internationaux des produits et techniques agro-alimentaires, association promoting the international trade of agrifood products and technologies
www.adepta.com



OSEO group was born, by bringing together French innovation agency Anvar and SME development bank BDPME, around a mission of general interest supporting the regional and national policies. Its mission is to provide assistance and financial support to French SMEs and VSEs and facilitate their access to banks and equity capital investors, in particular during the high-risk phases: Start-up, Innovation, Development, Buy out. Its subsidiary OSEO anvar supports technology transfer and innovative technology-based projects, by sharing the risk with the entrepreneurs.
www.oseo.fr

FRENCH Equipment Suppliers to the Food Processing Industry



World-Renowned Expertise

The Entire Range of Technological Skills and Expertise Driven by **World Leading Agrifood Industries**

The power of the French agrifood industry is a major asset for French equipment suppliers.

- > Clearing a 139.7 billion-euro sales figure in 2005 (up 1.9% compared to 2004), the French agrifood industry is **number one in Europe** ahead of Germany (€130 billion) and **number two worldwide** behind the United States.
- > Employing some 420,000 people, its 3,180 businesses with more than twenty wage earners handle every field of agrifood production, i.e., meat and poultry, dairy products, dry goods, and more.
- > The French agrifood industry is also the top world exporter of processed foodstuffs, ahead of the United States. France's exports reached €28.7 billion in 2005, generating a trade surplus of €6.9 billion. (Source Ania)
- > As a result, many of its groups and brand names enjoy planetary renown, e.g., Danone for its dairy products marketed under the company name, bottled waters (Evian, Volvic, etc.) and cookies (Lu), Pernod Ricard, the world's number two wine and spirits maker, Lactalis, Bongrain and Bel for their cheeses, and numerous specialists that are leaders in their field, e.g., Soufflet (grains), Castel (wines), Socopa (meat), Tereos (sugar), Andros (fruit processing), LDC (poultry), and many more.

From receiving raw materials to packaging consumer goods, the French equipment supplier industry offers a comprehensive range of products and services meeting the increasingly sophisticated needs of the global agrifood industry.

- > In France, equipment suppliers for the agrifood industry account for 157 companies employing nearly 12,500 wage earners (not including the packing industry). They gross a 1.68 billion-euro sales figure, of which 36.6% are exported (Source Sessi-EAE 2004). Aside from the manufacturers of machines for the agrifood industry included in the above statistics, overall, France has about 300 businesses that are directly involved in food processing.
- > APV France, Bongard, Vaslin Bucher and many more among leading industry names bear witness to the diversity of French skills and expertise that are **widely recognised** as can be seen by the fact that between 2002 and 2005, French exports of equipment for the agrifood industry climbed 40%, propelling France to fifth rank worldwide for exports.
- > The United States (10.4% of exports), Spain (10.3%), Germany (8.4%), Belgium (7.4%), Russia (6.4%), Italy (6.3%) and Algeria (4%) are among French food-processing equipment suppliers' major customers.
- > France also enjoys a **surplus trade balance** for its food-processing equipment since the cover rate soared to 168% in 2005, i.e., the best score since 2000.

(Source Ubifrance - GTA)

AN EXAMPLE OF AN EQUIPMENT SUPPLIER-INDUSTRIALIST PARTNERSHIP

Agroquip Turroques and Salaisons du Landoulet

Agroquip Turroques, in partnership with one of its customers, Les Salaisons du Landoulet, has developed a machine called G2, which binds dried sausages two by two. "The fact that our customer was nearby made it easier to conduct the test, validation and upgrading phases, when needed," explained Agroquip Turroques Company Co-Manager Christophe Munico. The company has devised a direct current motor system, which improves knotter reliability and increases production speed. Now that the industrialisation phase is over, Agroquip Turroques has started marketing the new machine.

Tailor-made first stages

PREPARING > WASHING > SORTING > CUTTING > GRADING > MIXING > CRUSHING >

As each raw material is unique, each treatment must be adapted accordingly. The first food-processing stages are designed to meet constraints of industrial safety, profitability and efficiency while, at the same time, handling the product with care. The goals are to ensure food quality, adapt to market demand, and limit losses. For meats, slaughter chains are becoming automated, thus improving productivity and product traceability. In the fine milling sector, several operations separate the bran, germ and kernel and optimise the baking value of flours. Fruit and vegetables are selected (according to size, aspect, sugar content, colour, and so on), washed, peeled and trimmed. In short, at the outset each industrial process incorporates particular constraints, which equipment suppliers work to overcome.



Norman: Engineering for Slaughter Animals

Norman, a slaughter chain specialist, engineers equipment adapted to different species, e.g., cattle chain platforms, pig heating and scraping machines, sheep skinning machines, and so on. For export purposes, among others, the company applies its skills and expertise to engineering missions (specifications, manufacturing plans, and so on). One of its latest advances has been the design of ergonomic slaughter stalls that allow for operator safety, adaptation to various religious rituals and the implementation of improved hygiene procedures. **“Safety and hygiene are two areas that have been substantially improved in the meat industry,”** confirmed Norman Export Manager Arnaud Caugant. Special mention should be made of robotisation, an area where the company is deploying synergy with Durand International, another subsidiary of the Bretèche group.

Durand International: Pig Processing Automation



With more than thirty years' experience in pig slaughter chain automation and calf carcass splitters, *Durand International* has broadened its range to include all the machines in the meat-dressing chain. The company adapts to the needs of the different markets, e.g., providing very high capacity chains processing more than 1,200 pigs per hour in the United States and Canada or, on the contrary, optimised equipment for chains that do not exceed 200 pigs per hour, in Japan for instance. **“Our solutions not only provide productivity gains in terms of labour and material yield but also in terms of substantial improvement of hygiene conditions,”** explained Durand International Sales & Marketing Engineer Pierre Lantheaume. Actually, recent corporate developments not only concern slaughter chain profitability and ergonomics but food safety during processing, as well.



VMI: Flexible Tools for Bakery and Pastry Businesses

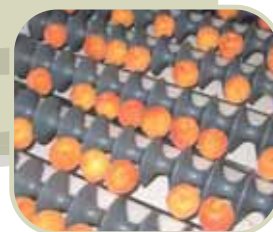
The *VMI* range of kneaders complies with different production capacities and with many kinds of bread. One of *VMI*'s latest innovations is the spiral-powered oblique angle kneader that does away with a manual operation and ensures kneading regularity. The Verymix 3 kneader is particularly suited for high-capacity automated batch-bread lines, as it controls energy consumption and vacuum management parameters. The cold tank spiral kneader is for recipes such as frozen pastries. Thanks to a design & engineering office with a staff of 46, *VMI* also develops tailor-made lines for industrial customers that **“require increasingly flexible tools that can adjust to a wide range of recipes,”** according to Sales & Marketing Manager Bernard Boisdron.



Maf Roda Agrobotic: Fruit & Vegetables from A to Z

Maf Roda Agrobotic, a fresh fruit and vegetable workstation-engineering specialist, promotes a work system that incorporates the entire line from receiving the product through to packaging. **“Depending on customer constraints,”** explained Sales & Marketing Manager Patrick Desset, **“our operation starts with flow and space management and extends all the way through to traceability management.”** The selective sorting of fruit and vegetables according to various criteria, i.e., weight, aspect, firmness, and sugar content, is the nub of the process. The company has developed a two stages work procedure, i.e., first, a sorting operation to prepare batches of homogenous products and then product packaging in optimum profitability conditions. The procedure, which was originally tested on apples, can now be used for other fruit.

Caustier France: Innovation for Grading Oblong Fruit... From Cherries to Watermelons



Caustier France keeps innovating with the engineering of revolutionary grading machines for cherries (CALITEL), olives, grapes, Mirabelle plums, kumquats, cherry tomatoes, apricots, and more, and of their matching devices (for cleaning, brushing, waxing and packaging **“Another one of our assets is the biggest date-fruit enhancement plant in the world, in Abu Dhabi,”** explained CEO Claude Caustier; his company also builds equipment for every fresh fruit and vegetable variety and has become the fragile fruit specialist.

Getting the best out of raw materials

SEPARATING > EXTRACTING > DOSING > PRESSING > FILTERING >
CONCENTRATING > DRYING >

From vines to wine and from milk to casein, processes enhance raw materials, unveiling their wealth of qualities. Applied processes are changing and optimising the development of the nutritional, organoleptic or functional qualities of products. For wine making, extraction and separation techniques are becoming more refined and improving productivity. Membrane techniques are used to select the ingredients that should be enhanced from those that have to be eliminated. Ultra-filtration concentrates milk proteins and increases cheese yield while microfiltration is a milk bacteria barrier. For every process deployed for ingredient extraction and concentration, dosing is a key operation. Thanks to its precision, production costs can be streamlined and product quality ensured.

PCM Pompes: Processing the Most Viscous Fluids



"Our core skill is fluid technology," summed up PCM Food Marketing Manager Cyril Chevanse, "*that is to say transferring, dosing, injecting and mixing - especially for difficult products.*" The company, which also does business in oil, chemistry, paper and the materials industry, focuses on very fragile viscous products. It offers either special components, e.g., pumps and on-line mixers that can be integrated into a full line, or Dosys designed systems that handle the entire stage of a process. Applications abound and are diversifying, i.e., for fresh dairy products, prepared dishes, bakery-pastry products, and pet foods. *PCM Pompes* is now able to work on hyper-viscous, virtually solid products such as caramels whose viscosity is to the order of a million centipoises compared to yoghurt viscosity that ranges from 2,000 to 5,000 centipoises. Aside from the accuracy of its volumetric dosing, the company keeps making it easier to clean its machines thanks to NEP (French acronym for on the spot cleaning) systems and improving its capacity to comply with the integrity of very fragile products with pieces or inclusions.

Vaslin-Bucher: From a Bunch of Grapes to a Bottle of Wine



The first *Vaslin and Bucher* winepresses date back to the Nineteenth Century. The two corporate names, which have been merged for some twenty years, have developed a grape processing equipment line with stalk separators. For the past several years, they have also been marketing an organic fibre-based tangential filtration process ensuring outstanding system cleanliness. "*We can be found anywhere wine is being made,*" explained Deputy Managing Director Gilles Dupuy, "*and we know how to meet our customers' needs depending on the regional cultures.*" *Vaslin-Bucher* has also engineered a sugar content reduction process called Redux that combines a special membrane filter with an osmosis machine, thus decreasing the alcohol content of wine by several degrees.

Applexion: Combining Separation Technologies



Applexion, which mainly works for bioindustries, develops processes based on separation technologies for liquid purification. One of its original features is its ability to combine different technologies, i.e., membranes, ion exchanges, absorption and chromatography, with the latter being central to the strategy of the Novasep group, the parent company of *Applexion*. "*Chromatography separates the molecules with the highest added value,*" remarked Applexion Sales & Marketing Manager Xavier Lancrenon, "*It can be applied to biomolecule purification, a field which is currently showing strong development.*"

Efficiency and product care

HEATING > COOKING > BLANCHING > STERILISING >
PROCESSING > EXTRUDING > COOLING > FREEZING >

Microorganisms do not like the cold or the heat. However, preservation treatments involve sterilisation, pasteurisation, cooling or freezing. For thermal treatment equipment, the challenge is to reach a compromise that ensures the bacteriological safety of the products while preserving their organoleptic properties. Sterilisers and pasteurisers now have precise settings to adjust readings (time and temperature). Cold is a standard, widespread means of preserving foodstuffs. From milk storage tanks to vegetable freezer tunnels, equipment keeps improving to meet today's challenges, i.e., save energy and ensure fast, controlled cooling for the preservation of product qualities. A wide choice of products can be made with certain types of equipment - extrusion, for instance, clears the way for creativity! Crackers can be shaped like stars or hearts and sweet biscuits can contain delicious fillings.

Lagarde: High Performance Autoclave Regulation



Lagarde markets autoclaves for sterilisation and pasteurisation, for cooked, packaged or unpackaged products, according to different processes, e.g., vapour-air, steaming, cooking in water, and more. The company's autoclaves may be static or rotating. *"We have a clear lead with our new Samantha regulation system that offers an infinite array of treatments,"* said Sales & Marketing Manager Lionel Lesterlin. The software, which is entirely based on an industrial PC, has been designed to meet FDA standards. The software manages time, temperature and pressure parameters faster, more accurately and more ergonomically. For instance, improved regulation optimises the processing of especially fragile foodstuffs, such as sea products. Moreover, *Samantha* has made improvements in the areas of traceability, data acquisition and data filing.

Stériflow: Thermal Treatment Adaptability and Mechanisation



Stériflow, which is also a specialist in the thermal treatment of packaged products, continually adapts its equipment to its customers' new needs *"The packaging, ranging from standard cans to plastic trays, guides the products,"* said *Stériflow* CEO Jean-Pierre Pinot, *"and we optimise our control equipment to preserve the intrinsic qualities of the foodstuffs."* The *Stériflow* range is also changing and moving toward treatment mechanisation and efficiency. For instance, its new *Shaka* system can shake products (an average of 150 pulses per minute) for faster heating. As a result, cycle duration can be reduced by a factor of up to five, thus helping to preserve the organoleptic qualities of the product.

Femia: Processing Green Vegetables



"Thanks to the ties we have forged with our processing customers for more than forty years, our company has opted to specialise in green vegetables," explained *Femia* Export Manager Alain Peltre. Specialisation has prompted the design of processing lines for canning as well as frozen food industries. Raw materials are handled from their arrival at the plant to the canning station or entrance into the freezer tunnel. Processing stages (ventilation cleaning, de-stoning, washing, grading and so on), which vary depending on the type of vegetable, end with water or vapour blanching and continuous cooling on a belt. The technology has additional applications for rice, dried fruit and sea products. Thanks to a partnership with two US companies (CCM and A&K), *Femia* now offers full lines for sweet maize processing.





Bongard: Flexible Use and Bakery Quality

Bongard started out as an oven manufacturer for bakeries. In the eighties it broadened its range of skills and expertise to include all laboratory equipment, by taking over companies specialised in supplemental equipment or in mixing (Loiselet, Marchand, and Esmach). *"We know how to design and supply a turnkey bakery,"* stated Bongard Sales & Marketing Manager Eric Soquet. Every operation is covered, i.e., dosing, cooling, kneading, fermentation, shaping, baking, and so on. A new patent has been filed meaning the company now offers a mechanized dough processing system that can make bread without any of the damage to texture that is usually caused by mechanical constraints. After inventing the tube oven in the seventies, *Bongard* developed an electronic fermentation control system as well as an oven with a piloted electric bedplate that ensures both energy savings and flexible use. International customers increasingly demand both these requirements provided they are combined with the improved quality of the consumer product.



Chalon Mégard: Increased Efficiency for Cheese-making

Chalon Mégard offers a full range of cheese-making equipment, ranging from mini-units to highly mechanised lines. In a situation where streamlining production is encouraged through centralising and specialising tools, the company offers lines that can process from 1 to 1.5 million litres of milk per day. *"The trend to concentrate volumes will endure,"* stated Sales & Marketing Manager Jean-François Nicolet, *even though we continue to provide equipment for French products under the AOC label (controlled appellation of origin) that buoy our international image.* Aside from its expertise in volumes, *Chalon Mégard* considers that its broad knowledge of the products fosters its ability to supply increasingly flexible equipment.



Servi Doryl: Increasing Yield While Preserving Cheese

"As our export business is growing, increasingly diversified products are included in our equipment set-up for cheese products," explained Servi Doryl Board Member in charge of Exports Frédéric Delacour. For instance, the company has succeeded in reproducing the methods of its usual practices for the manufacture of soymilk-based tofu in Asia. *Servi Doryl's* skills and expertise are based on the 'basin' concept which aims to combine yield and quality. For some products, large tanks mean exceedingly lengthy operations. *Servi Doryl* offers to replace the tanks with smaller containers on wagons travelling from the filling to the emptying stations combined with a curd-slicing robot so that productivity is increased without damage to the product. The system actually increases cheese production per litre of milk thus ensuring faster returns on investment.

Clextral: Extrusion Keeps Spreading

Twin-screw extrusion technology was first used for plastics and has since moved on to very different kinds of manufactured products such as banknotes or airbags for cars. Clextral has also developed the technology for food processing, e.g., flat breads such as craquottes in the early seventies, ready-to-eat cereals, snacks or dry pet food. *"We succeeded thanks to partnerships with our customers,"* pointed out Group Board Chairman Georges Jobard. The equipment continuously combines mixing, cooking, extrusion and expansion. Aside from making a crusty product, the equipment generates production savings (space, water and energy) and also enables numerous innovations. In 2002, Afrem, a French company specialised in machines manufacturing couscous grain, joined the group. Offering a growing number of full systems on emerging markets, *Clextral* is preparing new projects to keep broadening its range.



WestfaliaSurge Japy: Electronics Serving Milk



Milk refrigeration at the production site (the farm or collection centre) requires the implementation of different technologies, i.e., stainless steel boiler construction for tanks, refrigeration to stop germ proliferation until processing, electronic regulation of the entire system, automatic tank washing, milk quality measurements, and so on. *WestfaliaSurge Japy* continues to innovate to optimise technological effectiveness: volume measurement has been automated thanks to electronic gauges, which are then connected to the management system of the processing room or, more recently, refrigerated compressors that are bigger energy savers thanks to scroll technology. The company is now working on a regulation system with a built-in watchdog controlling every milk quality parameter in real time. *"Our equipment straddles the line between production and processing,"* explained Executive Product Manager Laurent Decaestecker, *"and, depending on the dairy organisation of the country, we can adapt to the requirements of both fields alike."*



Serap: Diversified Thermal Exchange Control for Wine

Serap Industries, which also specialises in milk refrigeration, has skills based on three fields of expertise, i.e., working on food-safe stainless steel to ensure full hygiene, thermal exchange control and expertise in composite materials for equipment insulation. Since the early eighties, the company has initiated diversification in wine producing equipment. Its latest innovation is the insulated SVM tank with a mobile lid so that useful volume can be tailored to targeted amounts depending on the requisites of the winemaking process. The range covers capacities from 15 to 100 hectolitres per tank. *Serap* also provides oenology consulting services abroad and designs wine storehouses and winemaking processes which are tailored to the type of wine desired. *"All wine operators invest in quality, especially in certain countries which, despite producing small amounts, would like to expand abroad,"* analysed Sales & Marketing Manager Stanislas Sychala, *"We have to comply with increasingly detailed specifications."*

Improved procedure control

Setting up a plant is always a challenge. Every aspect has to be incorporated to ensure efficient and safe production in an upgradeable environment. First, needs have to be properly defined, then choices have to be made for the implementation of the best available technologies and for their arrangement according to current production systems and those of the future. Measurement instruments, such as temperature or pressure sensors, play a key role in controlling operations. Process and traceability management systems ensure manufacturing operations and control. At dairy farms, sugar refineries, bakeries or biscuit plants, requirements are based on the hygiene, safety and reliability of facilities. Equipment suppliers and engineering companies provide tailor-made solutions to meet the special needs of each company... offering services that go even further!



APV France's Turnkey Facilities



"Both cheese-making technologies we have recently developed are destined to rapidly spread abroad," explained APV France Managing Director Jean-Michel Ingles. Not only is APV France the supplier for major customers such as Lactalis, Danone and Yoplait, but it has also engineered two new technologies which are specific to the dairy industries. The first is microparticulation technology which processes serum proteins and incorporates them into the cheese-making process. The second cheese-making technology with no separation or serum production, thanks to the input of milk protein powders, maximises yield. APV France, a turnkey facility specialist for dairy products and beverages, also supplies pumps, valves, homogenisers and thermal exchangers.

Pierre Guérin: Manufacturer and Full-line Supplier



Pierre Guérin manufactures equipment both for turnkey facilities and existing plants. The company offers full-line plants for liquid and semi-liquid dairy processes, excluding building and processing lines. It also designs tanks (for storage, fermentation, and so on), valves, pumps, mixers, agitators and, if needed, process automation. Pierre Guérin is both a manufacturer and full-line supplier. Drawing on its specialisation in dairy products, Pierre Guérin can also offer advice for product engineering in this field.

Fives Cail: Sugar Engineering Specialist



Fives Cail expertise in thermal and mechanical processes and in design and optimisation studies for the sugar industry. The company supplies pieces of equipment or builds workshops and full-line plants. In 2006, Fives Cail, working with other French companies, built a beet-sugar refinery in Turkey. Fives Cail research and development focuses on creating new equipment *"that is efficient for energy saving and productivity,"* but which also meets the need to extend plants *"a key element in competitiveness,"* underscored Export Zone Manager Jean-François Le Maout. Fives Cail, a Fives Lille Group subsidiary, relies on the numerous group facilities, namely in China, Thailand, Brazil, Mexico, Russia and elsewhere.

Axitherm: Agrifood thermal processing specialist



Axitherm is a technical service provider for sterilisation processes. Since 2005, the company has been providing a service called OTTA (French acronym for optimisation of appertized thermal treatments) that increases sterilisation speed by 10 to 20%, improves product quality and saves energy. *"It's a world first. In just a few cycles, our service enables up to 50% savings on water,"* Axitherm Manager Alain Fournial was pleased to announce. The company also supplies measurement systems (of temperature, pressure and deformation) for appertization and pasteurisation. Its most recent innovation is a full-line solution, i.e., a central data acquisition system with automatic sensor recognition, equipped with ergonomic AXPeriment software that can exploit readings from the equipment of other suppliers.

Packaging in all shapes and sizes

PACKING > PACKAGING > BOTTLING

By protecting products from outside contamination, packaging contributes to consumer safety. It also prevents flavour and taste loss and prolongs food life. Packaging can even be 'smart' and provide information on the state of product quality thanks to colour-changing indicators. In 'active' packaging, conservation agents or oxygen absorbers are built in to prevent the formation of gases which cause foodstuff spoilage. Packaging is also an information medium and tends to make product use easier. It can also be a strong marketing component. All of this and more is available with a wide choice of materials, e.g., plastics, steel, cardboard and glass. Packaging is therefore a critical component that requires ever faster automated lines.



Mécaplastic or the Assets of Modified Atmosphere



Mécaplastic, which makes plastic packaging machines, focuses its skills and expertise on placing fresh product packaging under modified atmospheres. For this purpose, the company engineers thermoforming (a film spool is heated and blow-formed to model package shape) and sealing technologies (a plastic film is welded onto the tray in a sealed enclosure facilitating vacuum-packing and the re-injection of a gaseous mix). The advantages of the technology are longer use-by dates and better preservation of product taste. "Our machines keep pace of packaging market changes driven by suppliers that create new concepts or materials," explained Mécaplastic Export Manager Patrick Causel.

Serac for Faster Filling



Serac specialises in filling and plugging machines for dairy products. "The specialty is one of our major assets compared to our international competitors," explained Serac Communications Manager Dominique Ledru. The company also packages beverages, vegetable oils, sauces and condiments. One of its latest innovations called "Multiflow" is an automated filling spout that can be tailored to all sorts of products. It reduces foaming, meaning that packages can be filled faster. The company has also developed the SAS 3, which draws on pharmaceutical expertise. SAS 3 is an aseptic filling line with a brand new type of insulator (RABS), which increases productivity.

Sidel: Plastic Solutions



Sidel manufactures packaging machines for all drinkable liquids, e.g., waters, beverages, fruit juices, beers, dairy products and so on. "Our core skill has a global scope and we do business in 180 countries," underscored Communications Manager Bertrand Guillet. One of the latest developments is Actis technology that was initially launched in Germany on the beer market. The process strengthens the leakproof quality of plastic bottles whose inner walls are lined with a 'barrier' preventing gas leakage, thus preserving beer bubbles and foam while forestalling oxidation. In 2006, *Sidel* launched a new generation machine called Actis 48 that triples production speed compared to the first generation. "The trend is productivity through speed, with lines that can bottle about 60,000 bottles per hour and per machine," concluded Bertrand Guillet.

R&D: Impress has chosen France



Impress activity in France initially began with a Research Centre in Crosnières (Sarthe département). The company has now chosen our country as a development target. "Our company chose France for future projects. We would like to draw on the nearby universities and engineering schools in Le Mans to recruit new employees," explained Research and Development Manager Philippe Gimenez. The Dutch Company, a metal can specialist, has recently developed a lid with a 0.18mm-thick steel ring. "This is a genuine technological innovation. We have gradually pared thickness down to 0.18mm from 0.22," underscored Philippe Gimenez. Easy opening, can shape, printing and package weight are all areas in which *Impress* innovates. "We offer bowl-shaped cans, narrow-waisted expanded cans or so-called 'three finger-grip' cans, thus breaking with the traditional image of the cylinder-shaped can," he added.

Certified good practices

To further cash in on the international and long-standing renown of its products, the French agrifood industry is at the forefront of the quality certification of its products, the safety of its procedures and compliance with environmental standards.

Ricard's Watchword, Ongoing Improvement



Ricard is a subsidiary of the Pernod Ricard group, the number two world leader for wines and spirits. *Ricard* was the first French agrifood company to receive triple certification for quality (ISO 9001, 2000 version), safety (OHSAS 18001) and the environment (ISO 14001). Operations Manager Pascal De Marchi explained, "We first implemented a methodological guide at our three industrial sites and then at our head office so as to organise the company according to some twenty processes - customer services, supply chain, risk management and so on - and not according to in-house departments. We then drew up indicators for the deployment of an ongoing improvement policy." Although corporate ratios were already good, the company has reported further progress. From 2001 to 2006, the indicator measuring delivery compliance reached 99.6%, waste was lowered by 21% (with a recycling rate rising to 90%), while the number of industrial-injury leaves was slashed by a factor of four. "Thanks to substantial training efforts, employees are no longer simply carry out their assignments, they control them personally," summed up Pascal De Marchi. *Ricard* is now working on formalising its sustainable development policies for packaging or energy resources, for instance.

André Bazin, Full Traceability



As a supplier of intermediary meat foodstuffs, especially for the pre-cooked meals industry, *André Bazin* has implemented a full traceability procedure that was crowned with ISO 9001 certification in 2002. Traceability organisation means the company can not only trace its raw materials but its ingredients as well and, since 2006, its packaging and animal guts. "We have developed a computer programme that reproduces our manual practices," explained Company Research and Development Manager Yannick Simonin. For instance, each workshop has been equipped with scanning guns to check each operation, thus ensuring compliance with recipes and prescribed amounts. Each operation has a batch label that is the basis for the next operation. "We have streamlined and improved our manufacturing process control," stated Yannick Simonin, "while deploying almost instantaneous response. If a problem occurs at a customer's, we can immediately isolate the relevant batch, detect any incident and recall all the products in the batch, if needed."

Euralis Gastronomie Centralises Retailing Audits with the IFS



Euralis Gastronomie, a duck slaughter and processing specialist, has obtained the renewal of its IFS (International Food Standard) Certification for its Maubourguet site (Hautes-Pyrénées département). French and German retailers created the reference system, mainly to monitor supplier inspection operations with a single audit and to avoid repeated visits to each banner store. When a higher level of certification is granted, it only has to be renewed every eighteen months. The reference system certifies quality management, infrastructures, compliance with HACCP (Hazard Analysis Critical Control Point) standards, and so on. "This policy has allowed us to involve the entire operations staff and not only the executives, thanks to the improved dissemination of information," explained Company Quality Manager Sylvie Laugerette. The executive is preparing the IFS and ISO 14001 certifications of two other sites, to complete the procedure.

Auriol: Automation Combined with Sophistication



For some fifty years *Auriol* has been making products which include pressure and vacuum cookers for low temperature cooking. At the request of an industrialist, it has recently engineered a vacuum evaporation technology for thick products. "Far from perpetual innovation, our business involves adapting to our customers' different types of processes. Our experience combines precise finishing touches with extremely sturdy products," explained CEO Pierre Auriol. Technological developments focus on increased process simplification and automation and on more sophisticated techniques. *Auriol* also develops sterilisation or pasteurisation autoclaves and centrifuges.

Capic: From Lab Tests to Community Kitchens



"Our technologies are driven by practicality, sturdiness and easy maintenance," explained Export Officer Thierry Lagathu "Our market demands fast response-time and the development of products tailored to demand," he added. The company intervenes at four levels, i.e., preparation, cooking, distribution and washing, and also offers full lines of ovens, fryers, kilns, self-service furniture, and washing machines. For prepared dishes, it supplies mobile catering, community kitchens, production equipment and, just recently, laboratory equipment. *Capic* has recently developed a range of pots and frying pans with 35 and 55-litre capacities, respectively, compared to the 80 to 500 litres commonly used. This Capi'top range is for industrial laboratories so they can test recipes on a small scale and for small catering facilities so they can acquire less bulky, lower cost equipment.

From processing to reclamation

The concern for environmental conservation and for economic interests can come together on the issue of processing the waste generated by a food-processing plant. Huge stakes are now involved with water because it is a leading production component.

Lacaze: Waste Processed into Fuel



Lacaze SA, an industrial hot water production specialist, logically began addressing the future of water effluents in the middle of the nineties. "We set up an environmental centre incorporating effluent treatment as well as the energy reclamation of greasy waste," explained CEO Pierre Lacaze "Hot water is one of the highest consumers of energy in a food-processing plant," he continued and "an industrialist has to find a fuel and eliminate waste." The company system involves recovering fats and processing them into homogenous and stable fuel, and conveying them to a self-ignition system. Among its latest advances, *Lacaze* has developed a hydrogas generator where the exchange between the combustion gas and the water is direct, thus avoiding passing through a heat exchanger. Thanks to combustion-water condensation, the system recovers all the energy. Moreover, return on investment is fast, especially for units using more than 200 cubic metres of water a day.

Maguin: Reclaims Pollutant By-products



The *Maguin* Incineration Department processes pollutant by-products that are "not recyclable or recoverable directly," explained Managing Director Daniel Pantel. Thanks to different types of equipment, i.e., dryers, rotating ovens, static and bench ovens, and screw-furnaces, the company offers thermal processes at temperatures ranging from 100 to 1,200 degrees (C). Numerous applications are available for food processing and the meat industry, among others. The resulting energy produces vapour, electricity, hot water, hot air, hot gases or thermal fluids that can be re-used in the process. "The rising price of oil and increasingly restrictive environmental standards are fostering a thriving market," explained Daniel Pantel. Furthermore, *Maguin* carries out smoke treatment with dry processing. Its latest innovation is a catalytic candle filter, which has received the Eureka label, providing an all-in-one compact solution for processing acid gases, dust, dioxins, and nitrogen oxides with very high purification yields. *Maguin* also has a mobile unit for on-site testing.

Suez: A Global Approach to Energy & Environmental Issues



The *Suez* group, which does business on every continent, provides local services for food-processing plants. The services focus on the operations and maintenance of energy utilities and their water treatment systems, and the sustainable reclamation of company waste and organic co-products. The *Suez* group, which also actively sells electricity and natural gas, focuses on the special needs of several major multinational customers who would like to have a global approach to their energy and environmental concerns. Christine Levêque, who is in charge of major agrifood industry accounts at the Group Strategy and Development Department, explained, "we are both a local service provider and global prime mover on the energy market, so we are in a position to address innovative solutions with our customers so they can save on the overall cost of their utilities. I'll give you an example - producing bioenergy from the waste and co-products from their plants. The ability of our subsidiaries to share and incorporate their different skills and expertise and put them to work for customers and sustainable development is our strength and this enables us to make a difference on the market."

A huge network serving technical progress

Innovating to meet consumer expectations and maintaining a sharp competitive edge on a competitive market are the challenges facing the agrifood industry. Its performance relies on the industry's ability to appropriate scientific and technological progress.

For their ongoing innovative policies, French agrifood industries draw on a network of technical centres under *ACTIA* (Association de Coordination technique pour l'Industrie Agroalimentaire)¹ and on public research organisations with more than 10,000 specialists. *AFSSA* (Agence Française de Sécurité Sanitaire des Aliments)² which is in charge of foodstuff sanitary and nutritional risk-assessment, also provides support to the industries.

ACTIA federates the activity of some forty technical centres addressing every field in the agrifood industry. *CTCPA* for preservation techniques, *ADIV* for meat processing, *ADRIA* for innovation and nutrition, *CEVPM* for sea product enhancement, and *ITERG* for fats are among the many technical centres. They have facilities to back corporate projects such as new product design, equipment testing, sensory analyses, and so on.

INRA (Institut National de Recherche Agronomique)³ provides expertise in human nutrition, manufacturing technology and processes, and microbiology. Other topics, such as aerualics, equipment and the environment are addressed by *CEMAGREF* (Institut de recherche pour l'ingénierie de l'agriculture et l'environnement)⁴, sea products by *IFREMER* (Institut Français de Recherche pour l'Exploitation de la Mer)⁵, and food and technologies in developing countries by *CIRAD* (Centre de Coopération internationale en recherche agronomique pour le développement)⁶.

Some programmes marshal scientific research organisations focusing on complementary areas of expertise, such as *CNRS* (Centre National de Recherche Scientifique)⁷, *CEA* (Commissariat à l'Énergie Atomique)⁸ or *INSERM* (Institut National sur la Santé et Recherche Médicale)⁹.

Schools of higher education host research teams addressing food, nutrition, and process engineering or production management.

PARTNERSHIP: Cryolog and Adria Create a Dynamic Use-by Date

When Cryolog was created in 2002, the company immediately developed a partnership with Adria Quimper (an *ACTIA* network technical centre) to engineer its microbiological Time Temperature Integrator, i.e., a range of adhesive labels dubbed (e0) and TRACEO that warn consumers when product freshness has expired. "The labels introduce the revolutionary concept of a dynamic use-by date, i.e., a use-by date tailored to real product preservation conditions," summed up Company CEO Renaud Vaillant. "Working with Adria Quimper opened the door for us to a highly efficient research environment in microbiology, forecast microbiology and food safety, among others, which combined fundamental and applied research," he continued. The product, which is already available at grocery retailers, entered the intensive phase of sales and marketing development in 2006. "It is part of the movement providing product quality transparency, which can be found throughout the food chain all the way through to end-consumers," concluded Renaud Vaillant.

The *OSEO* group (under the authority of the French Ministry of the Economy, Finance and Industry and the Ministry for Higher Education and Research) through its subsidiary *OSEO anvar*, backs innovation and technology transfer for laboratories, business creators and small businesses. In the food processing industry, *OSEO anvar* supports more than 300 innovation projects per year.

1 *ACTIA*, association for the technical coordination of the agrifood industry - 2 *AFSSA*, French agency for product health safety - 3 *INRA*, national institute for agricultural research - 4 *CEMAGREF*, Research institute for agricultural engineering and the environment - 5 *IFREMER*, French research institute for exploitation of the sea - 6 *CIRAD*, centre for international cooperation in agricultural research for development - 7 *CNRS*, French national centre for scientific research - 8 *CEA*, French atomic energy commission - 9 *INSERM*, national institute for health and medical research.

France's agrifood industry marshals its forces

As part of an overall policy to back innovation, thirteen competitive clusters have been identified in agrifood related industries. This is a new way of bringing together public and private facilities to design and implement the industry's future developments.

The French government drew up a list of awarded 66 competitive clusters. The goal was to back innovation and hone the country's competitive edge with regard to international competition. In competitiveness clusters, public authorities and economic movers concentrate their resources on promising projects in industries with strong growth potential, combining research scientists and businesses. In agrifood industries, 13 clusters are involved, handling issues that cut across various industry sectors or focusing on specialised agrifood networks and their issues.

An Answer to Global Needs

The huge stakes involved in nutrition and food quality occupy a choice place in the selected topics, as can be seen at the Nutrition / Health cluster (Nord-Pas-de-Calais), the Prod'Innov (Food and health) cluster (Aquitaine), the Q@limed (Agrifood) cluster (Languedoc-Roussillon) or the Children cluster (Pays de la Loire).

Technological innovation is also central to policies at the Industry and Agro-resources (Champagne-Ardenne and Picardie), Valorial (Tomorrow's food) (Bretagne) and Vitagora (Food nutrition) (Bourgogne) clusters. The Qualitropic (Tropical agriculture and nutrition) cluster (Réunion) adopts another critical cross-issue approach.

Cutting Edge Agrifood Networks

Their names say it all, Fishing Industry cluster (Nord-Pas-de-Calais), Fruits and vegetables (Languedoc Roussillon, Provence - Alpes - Côte-d'Azur and Rhône-Alpes), Specialized vegetables (Pays-de-la-Loire), Cereals Valley (Innovative grains) (Auvergne) and Innoviande (Meat and meats products) (Auvergne and several regions) clusters.

TESTIMONY: Jean Sirami, Innoviandes Competitive Cluster Coordinator

"Dedicated to every technology for the meat and meat-related industries, the brief of our cluster is to foster the emergence of projects, establish contacts between partners and support the compilation of project files and help their funding, among others. The cluster also aims at providing a showcase for French skills and expertise. In Clermont-Ferrand, we are going to set up a showroom for demonstrations that can be tailored to the special needs of industrialists worldwide. Our ambition is to broaden our approach and build a European network with other research centres."

Directorate General for enterprise (DGE): Directorate General for Enterprise (DGE) is under the authority of the French Minister for the Economy, Finance and Industry and the Minister for Industry. The DGE is in charge of preparing and implementing French industrial policy. Its goal is to hone the competitive edge of businesses in the international arena, initiate and promote an environment conducive to developing businesses and jobs, and back innovation and industrial research.

Accordingly, the DGE steers the implementation of competitive clusters and backs their development, specifically by supporting their research and development programmes and their international strategy.

COMPETITIVENESS CLUSTERS



SOURCE : DGE - SEPTEMBER 2006

COMPETITIVE CLUSTERS

A full array of training & education opportunities in every skill

From lab technicians to production managers, including line supervisors, there is a wide variety of food processing professions. An array of training opportunities is available, from secondary school certificates to degrees in engineering, to meet the diversified needs.

Training and education is available through schools, apprenticeships or continuing education. The programmes clear the way for entering the professional world or resuming a career path as a skilled worker (CAP, BEP, and BTA), acquiring the skills for handling different manufacturing stages (BTSA, BTS, DUT), or for controlling production and quality (engineering schools).

For each targeted job, education programs develop common core skills mainly focused on food quality and hygiene and special topics such as logistics or sales. The different areas of knowledge address product transformation from receiving goods to processing, quality and laboratory control, marketing, environmental protection, international economics and agrifood industry management.

A total of some thirty programmes clear the way to different industries and core skills. A few of the many opportunities are listed below:

- CAPA (Certificat d'Aptitude Professionnelle Agricole)¹⁰ - agrifood industries, dairy industry worker
- BEPA (Brevet d'Etudes professionnelles)¹¹ – processing with a major in agrifood industries
- BTA (Brevet technicien Agricole)¹² – processing with a major in screening laboratory
- Baccalauréat technologique Sciences et Technologies du produit agroalimentaire (STPA)¹³
- Professional baccalaureate (high school diploma) in processing bioindustries
- BTSA (Brevet technicien Supérieur Agricole)¹⁴ – agrifood industries with a major in the dairy industry
- DUT (Diplôme Universitaire Technologique)¹⁵ – in applied biology with a major in food and biological industries
- Degrees in engineering
- Masters degrees

Depending on their level, the courses are given at agricultural high schools, the Ecoles Nationales d'Industries Laitières¹⁶ that are part of the ENIL network (ENIL Poligny, Surgères, and others), at ENITA, Ecoles Supérieures d'Agriculture¹⁷, Ecoles Nationales Supérieures¹⁸ (INA-PG, ENSIA, ENSAIA, ENSBANA, and so on), and at other schools.

At the schools, the teacher-researchers are involved in international research programmes. Universities and foreign schools have also set up partnerships so that students can attend their courses in numerous countries.

Directorate for Development Projects Involving the Export of Technological, Technical and Professional Education Programmes The French Ministry of Education, Higher Education and Research has set up a department to promote the export of French technological, technical and professional courses. Partnered with French businesses and foreign training institutes, the department organises trainings courses tailored to local realities, meeting corporate needs and focusing on school-business relations.
Contact: dirpro.int@education.gouv.fr

10 CAPA, certification of agricultural professional aptitude, secondary school diploma - 11 BEPA, professional studies certificate, secondary school diploma - 12 BTA, agricultural technician certificate, secondary school diploma - 13 STPA, technological baccalaureate in agrifood science & technology, high-school diploma - 14 BTSA, agricultural technician, two-year college degree - 15 DUT, two-year technological college degree - 16 ENIL, schools of the national dairy industry - 17 Graduate schools in agricultural engineering - 18 Graduate schools.