SARIA Bio-Industries: Products and services that are part of daily life
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"Products and services that are part of daily life" was the title of a SARIA corporate brochure produced ten years ago. A great deal has happened in the meantime. Louder – and completely justifiable – calls from agriculture to (re)open the animal feed markets for proteins and fats made of safe animal by-products, as well as the search for new uses for organic by-products that are already being collected and processed (such as the production of biodiesel and biogas) are clear signs that it is becoming more important to make the best possible, safe use of materials rather than simply disposing of them.

The Management Board recently confirmed the SARIA Group’s positioning with regard to the current situation and future development. We want to grow globally and be successful as a provider of services to the agriculture and food industries, as a producer of renewable energies and as a manufacturer of quality goods for human consumption, animal nutrition, aquaculture, industrial applications and agriculture.

In the last issue of SARIAnews we invited you to join us on a journey to 26 of the 96 SARIA sites in Europe; today, we would like to show you the breadth and quality of products and services offered by SARIA. Even people closely associated with one of our business divisions or who think they know the SARIA Group very well may be surprised to discover how broad the product range is and the many uses to which products made by SARIA companies are put.

Did you know that Belgian fries benefit from SARIA Group products in the form of quality fats from UNIMELT in Germany or the French ALVA Group, which enhance the taste? Or that an ecoMotion biodiesel site produces glycerine and refines it to a such a degree of purity that it can end up in our toothpaste? Our biogas plants produce high-quality fertilisers as well as biogas. Ornamental fish enthusiasts actually choose specific feeds for their fish because they include products made by SARIA company VFC. These are just some examples of the broad portfolio of products supplied by the SARIA Group which are highlighted in the following pages.

The ReFood, SecAnim and SIFFDA names represent core activities for the Group which are all “part of daily life”. The professional collection and processing of food waste is essential to maintaining high standards in the restaurant and catering trade, as well as keeping fruit and vegetable produce in stores as fresh as customers expect. The meat industry and farming sector know how vital it is for risk material to be collected and disposed of quickly and hygienically – a service that SARIA plants in France, Germany, Poland, the Czech Republic, Austria and Spain have been performing for years.

Dear customers, neighbours and friends of SARIA, dear employees

‘Products and services that are part of daily life’ is not just the title of this edition of SARIAnews and a way of describing our activities, it is also a key requirement we have set ourselves. It allows us to focus our corporate activities on the needs of our customers and business partners.

“SARIA aims to focus firmly on customer needs across our international markets in order to enjoy continued success as a provider of services to the agriculture and food industries, as a producer of renewable energies and as a manufacturer of quality goods for human consumption, animal nutrition, aquaculture, industrial applications and agriculture.”

Following the tour of Europe in the last issue, I now hope you enjoy an interesting virtual journey that explores the wide range of quality products and services provided by the SARIA Group. These products and services have been developed based on close collaboration between the SARIA team and our customers and business partners, whose input is also vital for our continuous improvement process.

Best wishes

Dr. Kurt Stoffel
Products for many areas of daily life

**Use**

**Human consumption**
Whether it’s about taste, aroma, colour or appearance or the balance of substances used in food – animal fats have properties that make them perfect for baking cookies and bread and for use in frying fats, sauces, soups and ready meals, as well as in meat and sausage products.

**Animal nutrition**
Rich in vital nutrients (amino and fatty acids), meal and animal fats help ensure balanced nutrition in pig and poultry husbandry and aquaculture. In addition, certain abattoir by-products, meals and fats form the primary materials for pet food.

**Processing (examples)**

- Fat processing and pet food production (Issé, F)
- Fishmeal and fish oil production (Arteixo, E)
- Fertiliser production (Marl, D)

**Sources**

- Fish processing industry
- Food waste from restaurants, etc.
- Abattoir operations
Industry/renewable energy
Soap factories and the oleochemical industries have always used tallow and animal fat. These products can be used in a variety of ways (detergents, cosmetics, candles, lubricants, etc.). It is also possible to make biodiesel from animal fats.

Agriculture
SARIA Bio-Industries offers a complete product line of organic fertilisers for a natural way to fertilise soil (e.g. in agriculture, horticulture, gardens, golf courses, green spaces, etc.).
Products that are part of daily life

Examples from the food sector
Lard, refined beef tallow and poultry fat are products that are used in a wide range of ways when preparing food. They serve to enhance flavour, palatability or to facilitate handling.
UNIMELT GmbH in Würzburg, Germany, processes untreated fats derived exclusively from animals fit for human consumption and which have been slaughtered and prepared at EU-approved plants.

Before undergoing further processing at UNIMELT, these fats are checked again to ensure they are fit for human consumption. One UNIMELT product is refined beef tallow, which is primarily used in Belgium and the UK as fat for frying Belgian fries and Britain’s famous fish and chips.

Refined beef tallow is beef dripping that has been physically treated to make it neutral in terms of taste and smell and ensure it contains a maximum of 0.2% free fatty acids. Due to the low proportion of free fatty acids, the smoke point is over 200°C. This means that no unwanted smoke develops when used as frying fat, which is heated to approx. 190°C.

The company provides a complete range of hydrogenated fats which are used in the food industry to produce items like cookies, sausages, fat and ice cream. Due to its innovative research and development team, ALVA is able to offer its customers increasingly healthy, simple products which are just as tasty as margarine or butter.

To meet the requirements of major food manufacturers, ALVA is one of the few companies in this market to provide different plant or animal blends in packs ranging from 250g to a 25-tonne silo load.

The most important aspect is best described by someone who works in the business, however. According to Martin Apers, the owner of one of the finest “chip shops” in Belgium, “Beef dripping enhances the flavour of the fries, whereas plant oils overpower the potato due to having a stronger taste of their own.”

Fish 'n' chips and Belgian fries

UNIMELT supplies frying fats to the UK and Belgium

A complete range for flavour

Quality fats for food

French company ALVA, in which SARIA has a 50% stake, specialises in processing animal and plant fats for the food industry.

ALVA collects and processes animal fats, such as lard and duck fat, and manufactures blends with many plant oils.

To meet the requirements of major food manufacturers, ALVA is one of the few companies in this market to provide different plant or animal blends in packs ranging from 250g to a 25-tonne silo load.
UNIMELT: Specialising in variety

Unprocessed and refined fats of the highest quality

As well as refined beef tallow for frying, there are many other food uses for UNIMELT products.

UNIMELT also produces lard which is used in the bakery industry, for example. Lard or refined beef tallow (premier jus) is also utilised to make ready meals and frozen foods such as soups, vegetables, red cabbage and more. Lard is supplied to other businesses that produce items for household use or for the restaurant and catering trade, often involving the addition of greaves or culinary herbs.
Products that are part of daily life

Examples from the animal feed and pet food sectors
Fishmeal, fish oils, animal proteins and fats or frozen animal by-products can be utilised in many ways in the pet food industry, aquaculture and animal feed.
Even Columbus knew about fishmeal, if old reports and engravings can be believed. In the 17th century, American Indians on the continent’s east coast caught fish to eat but also to dry in the sun, grind and use as an organic fertiliser for their corn crops.

Publications by Professor Friedrich Lehmann of Göttingen, Germany, in 1892 eventually led to large-scale production of fishmeal as animal feed, although the agricultural community initially regarded this new development with scepticism. Tests carried out by Lehmann, whereby none of a group of 700 pigs fattened on fishmeal developed rickets, helped pave the way for a successful fishmeal industry. Some countries like Bangladesh still use the same methods as in Columbus’ day. Fish dried in the sun is primarily a source of food though, with animal feed being a secondary use. In terms of legislation on animal feed, fishmeal is a single-component feed like soya but with the advantage that it contains essential amino acids which are vital to the development of young animals. Fishmeal is blended with other single-components at mixed-feed plants. It is possible to produce both meal and pellets during this process. Due to its characteristic smell, fishmeal is used in pig husbandry, poultry breeding, aquaculture and the pet food industry.

Pet food industry
Within the pet food industry, a distinction is made between wet and dry food. Dry food is becoming ever more popular in Western Europe, with fishmeal being used as a protein source.
source by leading pet food manufacturers, who apply strict quality standards. The characteristic smell is the key factor because it makes dry food more palatable to dogs and cats. Essential amino acids also help puppies and kittens develop into healthy adults. Dogs and cats are not vegetarians; they prefer animal proteins because that is their natural diet. A small proportion of fishmeal is added to dry food. For dogs, dry food takes the form of pellets, chips or shaped products like bones.

Aquaculture
High-quality fishmeal (with a protein content of more than 70%) has been used in aquaculture for decades. Large quantities of fishmeal and fish oils are used as a source of protein when rearing salmon and trout in particular. Various formulations are blended and extruded.

Ornamental fish
Anyone with an aquarium will recognise the typical ‘fishy’ aroma of fish food. The reason it smells like that is because it contains fishmeal. Well-known makers of fish food obtain fishmeal from Cuxhaven to incorporate into their products. Ornamental fish food generally takes the form of flakes or pellets. The variant chosen depends on how a particular species of fish feeds. Flakes tend to float on the surface of the water to start with and then slowly sink, while pellets sink to the bottom relatively quickly and are taken from there. Shrimp meal is often preferred for fish which are especially colourful. This is due to the natural pigments (carotenoids) found in the feed, that enhance the colouring of the fish.

Within Saria, VFC (Vereinigte Fischmehlwerke Cuxhaven), Germany, Bioceval in Concarneau, France, and Artabra/La Coruña, Spain, specialise in producing fishmeal and fish oils.

von Holten

Leading pet food manufacturers such as Nestlé and Royal Canin use fishmeal as a source of protein and to improve the palatability of food for dogs, cats and ornamental fish (Tetra)
Aquaculture and the associated technology is a fast-growing global market. Farmed fish currently represent about a third of total fish production. While the total amount of wild fish being caught is in decline, the demand for fish products is rising. This makes aquaculture increasingly significant worldwide.

Cultivating fish in this way requires ever-larger quantities of fishmeal, which is rich in protein. From a global perspective, fishmeal is mainly obtained by processing fish caught exclusively for this purpose. However, because the supply of fish is not inexhaustible and overfishing has already affected many of the world’s oceans, it is unrealistic to expect an increase in fishmeal over the next few years.

SARIA’s fishmeal operations in Cuxhaven (Germany), Arteixo (Galicia, Spain) and Concarneau (Brittany, France) produce fishmeal and fish oils solely from fish waste from the fish processing industry. By continually improving the speed of collection and processing, while ensuring material is kept chilled and not mixed, it is possible to produce high-quality fishmeal tailored to different applications.

Other sources of protein are also being used to meet growing demand. In addition to our fishmeal products we supply hydrolysed feather meal and blood meal for use in aquaculture. Both products contain high levels of protein and are a cost-effective way of creating balanced formulations that supplement fishmeal.
Fishmeal derived from fish scraps from the fish processing industry is a valuable resource in aquaculture.

The pet food arm of SARIA France operates under the name KERVALIS. This group offers a wide variety of products, including lard and poultry fat, animal proteins, fishmeal and fresh/frozen products.

After the UK and Germany, France is the third largest pet food market in Europe. This market, which continues to grow, is serviced by KERVALIS in France.

KERVALIS has five facilities in the west of the country (Les Essarts, Issé, St. Hervé/Uzel, Trémorel and Vitrel) which specialise in different raw materials and thus offer a complete range of finished products. The processed animal proteins can be used in dry food, for example, and the frozen products as wet food for cats and dogs. KERVALIS’ strength lies in diversifying its product portfolio to meet different requirements, ranging from small pet food makers to premium customers.

The company operates in a market where product quality is extremely important. Its production facilities are therefore subject to stringent checks in terms of cleanliness and hygiene.

KERVALIS – Premium supplier to the pet food industry

Five production sites in France

Poultry fat from KERVALIS is also used in pet food products

Pet food products made by Proplan and Royal Canin are among those that contain fishmeal products from KERVALIS (France)
As well as fishmeal, SARIA company VFC (Vereinigte Fischmehlwerke Cuxhaven) produces fish oils and special salmon oil from fish waste from the fish processing industry.

Both fishmeal and fish oils are generated during the production process. Depending on the quality of the primary material, the quality of the resulting fish oil makes it suitable for feed or technical applications.

- **Fish oil of feed quality for rearing piglets and feeding sows**
  A feed experiment carried out in spring 2007 by the Regional Institute for Agriculture, Forestry and Horticulture in Iden, Germany, demonstrated that salmon oil is a good substitute for plant oils. In fact the experiment showed that piglets preferred feed with salmon oil added to it. Since this study, the sale of salmon oil and other fish oils has risen sharply in this segment.

- **Fish oils in aquaculture**
  Like fishmeal, fish oils have been used for decades in feed for fish such as trout and salmon to act as a source of energy. And just like fishmeal, fish oil is a single-component feed and can be processed with other components to make fish food (pellets). Fish oils also contain molecules to which aroma is attributed, which help ensure that farmed fish tastes like fish. For this reason it is very difficult to completely replace fish oils and fishmeal with plant oils.

*Bodo von Holten*
SARIAnews: The use of animal by-products is subject to very changeable conditions. What is the situation at the present time?

Manfred Gellner: Many different requirements need to be observed when it comes to using animal by-products. There is a whole raft of EU regulations and German legislation, with compliance being strictly monitored. I don’t intend to discuss the value or otherwise of specific regulations, but while it is clearly necessary to protect people and animals from risk this complicated regime makes it more difficult to get the best use out of animal by-products. In some cases, it actually makes it impossible.

SARIAnews: How has the use of animal by-products changed over time?

Manfred Gellner: These days, highly specialised products made of animal by-products are used in many industrial processes. Such products are characterised by high quality and excellent properties. Even though some of the applications are now much more specific, knowledge regarding the use of raw materials contained in animal by-products is centuries old and – I hope – may soon undergo something of a renaissance.

SARIAnews: Can you give an example?

Manfred Gellner: For me, the best example is an old chart showing the products which can be made using bones. This chart is at least 70 years old and highlights the various applications and tremendous potential in an incredibly simple way. In former times it was taken for granted that bones are a raw material that can be used to produce soap, glue, china or medicines, for example. This historic chart also demonstrates that people thought in a very sustainable way back then. Sustainability is a real buzzword these days, but if you look at this chart, it is clear that no great progress has been made over the past ten years. In some cases it is fair to say things have even gone backwards. I think we should still be making the best possible use of all raw materials. On economic grounds we simply cannot afford to squander the available resources, let alone from an ecological and ethical perspective. This all depends on customer needs, however, and on acceptance by the general public. As well as commercial factors, making full use of the raw materials in animal by-products has environmental benefits.
Changing conditions

Only a few obstacles left for new (old) ways of creating value through animal by-products

If the legal and regulatory environment with regard to permitting animal proteins to be used in livestock feed changes, together with moves to promote animal biomass as a source of renewable energy, it will be possible to create genuine value from animal by-products again. Most importantly this will benefit the environment, as well as the meat industry and agriculture.

Processing animal by-products is a service provided for the meat industry – a fact which is often not properly understood. This is largely because no one thinks much about what happens to animal by-products beyond the point where they land in the waste container during the slaughtering process or disappear from view down a chute. The efforts on the part of plants that process animal by-products to specialise more in order to derive even greater value is proof of how important animal by-products are.

Given pressure from rising feed prices, there is a drive to regain permission to use animal proteins for this purpose. In November 2007, farmers, feeders, breeders and slaughtering and meat operations appealed for animal proteins to be permitted in feed again. The new Cypriot consumer protection commissioner, Androula Vassiliou, has even announced her intention of submitting a recommendation before the end of the year that would permit feeding of animal proteins – excluding those from ruminants – to pigs and poultry.

Approval for aquaculture

For this reason, the European Fat Processors and Renderers Association (EFPRA) has submitted its own proposal to the Commission regarding the approval of non-ruminant proteins for use in aquaculture. In addition to traceability and transparency, channelling is a priority for EFPRA. In this context, channelling means strictly controlling flows of materials to avoid involuntary mixing (cross-contamination). Raw materials would only be collected from plants that slaughter one species or operate separate lines and delivered directly to a plant that specialises in processing animal by-products from a single species. The proteins would then be sold only to fish food producers who exclusively manufacture fish food and no other feed for farm animals. This would prevent animal proteins from getting into cattle feed. Fish food would in turn only be provided to fish farmers. As a rule, fish farmers do not rear any other types of animal so cross-contamination from using the wrong feed can be ruled out. In the past few years, aquaculture has experienced double-digit rates of growth worldwide. Due to being easily digestible, animal proteins can partially replace fishmeal.

Using animal proteins in feed not only adds value but also reduces fees for the slaughtering and meat processing industries. Animal proteins also represent an easily digestible feed component. At present, 3.5 million tonnes of plant proteins are being used to compensate for the ban currently in place. To replace the animal proteins produced in the EU it would be necessary to plant soya beans across an area the size of Belgium and the south of the Netherlands. If plant protein from South America is used as a substitute, the consequences are clear: rainforest clearance, desertification, less biodiversity. The EU is thus allowing rainforests to burn because animal feed is banned here or must be used as fertiliser (animal by-products are a source of phosphate, as well as protein).
Use as biomass

The European oleochemical industry in particular benefits from the German ban on using fats in feed because it uses them to produce soaps, detergents and cosmetics. The focus here is on category 3 fats. Only very few plants within the EU use category 2 fats. Although it is possible, category 1 fat is not utilised. As a result, new uses for these fats needed to be found and developed. The key application is burning fats in boilers at animal by-product processing plants to replace natural gas or oil. This makes the plants self-sufficient in terms of energy, allowing them to cut their energy costs significantly.

EFPRA has submitted an application to consider this method as a safe alternative to incinerating refuse. Producing biodiesel from category 1 to 3 animal fats is also recognised as safe. This fuel has been proven safe for use in vehicles and engines both scientifically and in practice. There are biodiesel facilities of this kind in Germany, Austria, Spain, Scotland and Denmark.

However, the German government has decided that only category 3 materials are biomass for the purposes of German regulations on biomass (BiomasseV). As a result, categories 1 and 2 are excluded from being used as biomass. By contrast, the European definition of biomass considers it to be “the biodegradable fraction of products, waste and residues from agriculture (including vegetable and animal substances), forestry and related industries”, i.e. all animal by-products. Germany is the only EU country to make an exception. For the German slaughtering industry, it means that the ribs of cattle are biomass but not the spinal column, empty intestines are fine but not full ones, and a slaughtered chicken is biomass but not one that has been run over!

This also applies to meal and fats, which must be incinerated in cement and steel works and power plants. These could just as easily be used in biomass heat and power plants to produce renewable energy. In 2006, for example, 300,000 tonnes of meal and 143,000 tonnes of category 1 and 2 fats were used to generate thermal energy. In total these incinerated products have an energy content of some 11 x 10^9 megajoules – equal to the annual consumption of 240,000 households comprising around a million people. This does not even take using the heat into account (combined heat and power). The true potential is therefore much higher.

Unfortunately, the Biomass Ordinance also applies to biodiesel production, so only category 3 biodiesel counts as biodiesel. While Germany is putting the brakes on these innovations, the Danish EU commissioner for agriculture, Mariann Fischer Boel, is keen to promote biodiesel made from category 1 and 2 animal fats as a second-generation biofuel because it is made from by-products and waste. Due to the fact that biomass of animal origin is derived from by-products, and therefore does not need to be grown specially, it has a much better ecological balance sheet than biomass from plant material. It is therefore more worthy of support, particularly if sophisticated new technologies are deployed (see also page 34).

Summary

Taking all the risks into account, the renewed use of animal proteins to feed farm animals needs to be seriously considered – and fast. Using animal biomass to produce renewable energy should also be encouraged to the same extent as biomass of plant origin. Then it will be possible to create genuine value from animal by-products again. Most importantly, this will benefit the environment, as well as the meat industry and agriculture.
Arnold Kubinek, who works at the SARIA plant in Mankovice (Czech Republic), controlling the sewage plant.

Local manager Thomas Rips checks the temperature of fat tanks at the ReFood plant in Melle.

The men responsible for planning the Bereza facility (from left): Dr. Eberhard Schmidt (SARIA Management Board), Ivan Kehm and Jens-Peter Kreft (project engineers).

The new SARIA plant in Bereza in the southwest of Belarus (Brest district) will dispose of waste from agriculture and slaughter operations within a radius of some 200 km.

Tomas Bohacek, commercial director at REC spol. s.r.o., Mankovice (Czech Republic); Sabina Jordanová, plant manager; Manfred Gellner, member of the SARIA Management Board; Jeannette Slezingrová, executive assistant; Dr. Vaclav Jordán, managing director of REC spol.; Richard Lachout, managing director at Tulln (Austria).
Rafting at the SARIA summer party

Robert Wos, commercial director of SARIA Malopolska, indicating the catchment areas for SARIA sites in Poland

Fish conference in Concarneau (Brittany) (from left): Valentin Garcia, (managing director of DIMARGRASA), Francisco Fernandez (branch manager at ARTABRA – La Coruña), Jean-Louis Hurel (member of the SARIA Management Board)

SARIA

ReFood conference in Mützel, Germany: Franz-Bernhard Thier and Manfred Gellner (both members of the SARIA Management Board) are seated in the foreground here

Johannes Fuchs, plant manager at Tulln

Ivica Domazet working in the control station of the Tulln facility in Austria

Rafting adventure at the SARIA summer party
Products that are part of daily life

Examples from the arable farming sector
In the shape of DynaTer and DynAgro, SARIA offers two fertiliser products that are being used more and more in agriculture. The basic materials for these are category 3 meal (DynaTer) and the fermented residue from biogas production (DynAgro).
In addition to SARIA’s activities in disposal services, raw material production and energy generation, its ReFood subsidiary has become an increasingly important supplier of high-quality, organic fertilisers for agricultural use. ReFood’s DynAgro product is an organic fertiliser featuring a high level of nutrients and fertiliser value, while the KFU group has been producing high-grade DynaTer organic fertiliser for some time, which is successfully and widely used in the agricultural sector.

DynAgro and DynaTer are not just of interest due to their fertiliser value. Economic and ecological factors are also important here. Mineral fertilisers are becoming increasingly expensive due to high energy costs and rising raw material prices. Because they deplete natural resources such as phosphate, mineral fertilisers are also a cause for concern from a long-term environmental perspective. By contrast, turning organic waste into fertilisers for agricultural use closes the nutrient cycle, thereby saving energy and conserving important resources.

- **DynAgro**
  Together, the four ReFood production facilities in Malchin, Kogel, Genthin and Schwallungen currently produce 160,000 tonnes of DynAgro a year. The main source materials for DynAgro are food and kitchen waste, fat separator contents and commercial fertilisers. These materials are crushed (< 12 mm) and sanitised (at a minimum of 70°C for 60 minutes) before being fermented in a biogas plant. After generating energy in the form of biogas, a valuable organic liquid fertiliser is obtained which has the properties of a compound fertiliser. In addition to nitrogen, phosphorous and potassium, which are all essential for plant growth, it contains calcium, sulphur and other trace nutrients which encourage healthy plant growth.

  The fermentation process, which breaks the organic matter down, means the nutrients in DynAgro are largely in mineral form and therefore easily absorbed by plants. The extent of fermentation also has the beneficial effect of significantly reducing smell pollution compared to commercial fertilisers. The high proportion of water in DynAgro (approx. 96%) makes this product suitable for use on unworked farmland, as well as on grassland and young crops. This is because it drains off plants easily and soaks into the ground without damaging the plants.

- **DynAger**
  
  DynAger is a liquid, organic NPK fertiliser which is applied near ground level using drag hoses. This minimises the smell further and prevents nutrients from potentially disappearing in gaseous form.

![Denitrification of silo corn following the application of nitrogen fertiliser in various forms](source: Thuringian Institute for Agriculture, Jena (TLL))
DynaTer
At the KFU site in Marl, approximately 30,000 tonnes of DynaTer are produced each year. DynaTer is a protein meal of animal origin containing high levels of nitrogen (approx. 7% N) and phosphorous (approx. 14% P₂O₅). It is formed while processing materials of animal origin which are suitable for human consumption (category 3). Due to the process involved, it is hygienically safe to use the substance as an agricultural fertiliser – there is no risk to humans, animals or plants. The high fertiliser value of DynaTer stems from its favourable nutritional composition and fine consistency. This means it decomposes easily in the soil for a rapid effect. Due to the high proportion of organic matter, DynaTer is also effective long-term. The organic nutrients are not used completely in the year of application, but rather continually over time. DynaTer can be applied in spring or autumn on both arable land and grassland. As an organic NP fertiliser, DynaTer can be spread using standard agricultural techniques.

Stable agricultural production depends on providing the soil with nutrients. When these nutrients are supplied by way of high-quality organic fertilisers such as DynAgro and DynaTer, this makes both economic and ecological sense and is therefore sustainable.

Dr. Thomas Leppin
Products that are part of daily life

Examples from industrial applications and the renewable energy sector
We are surrounded by products featuring SARIA ingredients such as fats, oils or glycerine that are intended for everyday use. The range of applications will surprise you. SARIA companies ecoMotion and ReFood also generate sustainable energy like biodiesel, as well as electricity and heat from biogas.
First you need to know how wire is made. The raw wire with a diameter of 5.5 mm must pass through a dry-drawing machine, where it is dragged through drawing dies to achieve the desired thinner diameter. The drawing dies (made of diamond or cemented carbide) have a small, tapered hole through which the wire is drawn. The diameter of the hole becomes ever smaller to thin and lengthen the wire.

The raw wire is initially descaled to remove rust, until it is perfectly clean. Then the wire passes through the drawing dies in a number of stages. This all happens at speeds of up to 50 m/s which obviously means the wire becomes hotter and hotter. This is where TRAXIT’s dry lubricant comes into play. Ahead of each drawing die there is an applicator containing the lubricant. When the wire passes through the drawing die, it picks up lubricant to ensure a smooth passage. The wire lubricant needs to be stable in terms of pressure and temperature so that the wire glides smoothly through the small opening in the drawing die. The choice of lubricant also affects the surface properties of the wire.

What do a paper clip, a steel-wool pad for cleaning and a metal spring all have in common? They are made of metal wires of varying thicknesses. And what do these wires have to do with SARIA company UNIMELT? The answer leads us to one of the top manufacturers of dry and wet lubricants for the wire industry: TRAXIT International, based in Schwelm near Wuppertal, Germany.

Traxit – A dry lubricant for wire drawing

How does the wire get through the hole?
But what is the fine-grained dry lubricant made of to ensure it adheres so quickly? For the chemists reading this: it is mainly sodium or calcium dry lubricants that are used. For a sodium-based dry lubricant, sodium hydroxide is mixed with animal fat – ideally from UNIMELT – to produce a sodium soap and water.

To obtain a calcium dry lubricant, calcium hydroxide is used in place of the sodium hydroxide. Dry lubricants are manufactured in large continuous mixers where animal fat, alkali substances and additives are mixed and react. Then the resulting material is ground using various techniques to attain the desired final grain.

Fats thus have an important special function in wire manufacturing.
Every year, SARIA companies KFU, UNIMELT and ALVA (France) supply over 170,000 tonnes of animal fats (category 3, i.e. food-grade fats) to the fat processing industry, where they are utilised as a basic material in many products or in a variety of technical processes.

In the chemical industry, fat is split into glycerine and fatty acids. The fatty acids stearin and palmitin, of which there is a high proportion in our products, are mainly processed to make metal soaps (aluminium stearate, magnesium stearate, zinc stearate, etc.).

Metal soaps are often used as additives in the plastics sector, e.g. as stabilisers for PVC films or other plastics, as lubricants or as the base for unguents in the pharmaceutical industry.

Stearates are also used as hydrophobic agents in external plaster (to prevent water penetration), as a finish on fine papers or to produce biodegradable hydraulic fluids, e.g. for machinery in the food industry.

From soaps and cosmetics to detergents, candles, dyes and additives, lubricants and polishing agents, animal fats can be used in a very wide variety of ways. They are certain to become even more widespread in the face of price rises for additives derived from crude oil.
For many years now, SARIA Bio-Industries has been involved in producing renewable energy – new energy from the meal and fat products that accumulate at its plants on a daily basis, as well as from food waste, waste cooking oil and used frying fats.

By processing animal by-products, food waste, waste cooking oils and used frying fats, it is possible to produce high-quality products for everyday use. At the same time, energy generation is also becoming increasingly important.

SARIA subsidiary ecoMotion produces over 200,000 tonnes of biodiesel every year at three biodiesel plants. A large proportion of this is used to run the RETHMANN fleet of trucks – which has proven to work very well. This benefits the environment considerably because every kilogram of biodiesel prevents the emission of two kilograms of CO₂ (see also SARIAnews 2/2006).

At biogas plants, electrical and thermal energy is generated from food waste. This energy is then used in the production process, with any surplus being supplied to the local grid. SARIA subsidiary ReFood currently produces 8 megawatts or 64,000 megawatt hours of energy per year at a total of four biogas plants. Other plants are planned (see also SARIAnews 1/2007).

Many SARIA plants also use animal fats as an alternative to fossil fuels such as fuel oil and natural gas. Meal which cannot be used for any other purpose is incinerated to provide a substitute fuel for power plants, coal-fired and steel works.

Altogether the RETHMANN Group’s biogas plants, domestic waste incinerators and biomass power plants generate some 1.7 million megawatt hours of electricity and 2.2 million megawatt hours of heat per year. This represents a very significant contribution in terms of renewable energy.
Leather is required in increasing quantities by the automotive, shoe and furniture industries, the fashion industry, makers of leather goods and luggage, and others.

Fish oils containing higher levels of free fatty acids (FFA) are used to tan hides in order to produce specific types of leather. The fish oil is pressed into the skins by means of a mechanical process – tumbling – involving very heavy wooden hammers, for example. Excess fish oil is rinsed out in a brine solution and the skins are then air-dried for many weeks. This tanning process, which takes several months, is repeated multiple times, with a skin being tumbled and dried again and again.

Chamois is one type of leather which is made by oxidising fish oil on sheepskin or lambskin where the grain has been removed by splitting or frizing. Here a distinction is made between chamois made solely using fish oils (genuine chamois) and that made by using first formaldehyde and then oils (combination chamois). Chamois leather is produced from sheepskin, lambskin and deer, chamois, goat and reindeer hides. VFC sells technical fish oils by the tank for these purposes.
Producing biodiesel from plant oils or animal fats and oils is eco-friendly, results in hardly any wastewater or waste and generates a series of by-products which are highly sought-after in their own right: feed (rapeseed cake), fertilisers (potassium sulphate), glycerine and methanol.

The rapeseed cake that forms while producing rapeseed oil is a popular feed for cattle. Potassium sulphate accumulates during transesterification and acts as a high-quality fertiliser. Methanol is reused in the process of producing biodiesel. We describe below in more detail how raw glycerine, which is produced in large quantities, is used.

SARIA subsidiary ecoMotion produces biodiesel at three sites: Malchin (from animal fats and frying fats), Lünen (from animal and plant fats) and Sternberg (exclusively from plant oils, chiefly rapeseed oil from its own rapeseed mill). Large quantities of glycerine are created in the process at all three facilities (up to 22,000 tonnes per year).

Glycerine, also known as glycerol, is a trivalent alcohol (C₃H₈O₃) which is colour- and odourless, viscous and absorbs moisture exceptionally well. This last property in particular makes glycerine useful in many diverse applications. The glycerine produced at the multi-feed biodiesel plant in Lünen (based on animal fats) is used in biogas facilities, etc., where it helps boost the amount of methane gas produced, as well as in biological sewage plants, where it acts as an additional source of carbon to break down nitrates. The glycerine manufactured here is also utilised as a raw material in the chemical industry. The raw glycerine which arises when producing biodiesel from rapeseed can be added to animal feed in dairy farming, as well as providing a source of carbon for sewage plants. At the Sternberg plant, raw glycerine is refined into so-called pharmaceutical glycerine, which is used to add moisture to cosmetics (ointments and creams) and in the tobacco industry to keep tobacco moist. Glycerine can also be used as antifreeze, a lubricant and plasticizer and is required to manufacture plastics, microchips, dyes and toothpaste.

There are likewise numerous uses for glycerine in the food industry (e.g. keeping dates and chewing gum moist), as well as in the medical and pharmaceutical sectors.

Another somewhat explosive application is to mix nitric acid, sulphuric acid and glycerine to obtain nitroglycerin, which goes on to be made into dynamite. As you can see, glycerine is almost everywhere.
On 31 March 2008 the DAKA a.m.b.a. biodiesel plant in Løsning, Denmark, came on stream. The facility will produce 50,000 tonnes of fatty methyl esters every year to supply the Danish and European transport sector. The plant was established as a joint project by DAKA and SARIA. DAKA is a leading European processor of animal by-products which is mainly active in Denmark and Sweden.

The special feature is that animal fats derived from waste from agricultural production (livestock and meat) are used as the raw material. Without being impacted in any way by the recent passionate debate regarding competition between food and biofuel production, this plant will produce biofuel with an outstanding CO₂ balance sheet. Almost 80% less CO₂ is emitted compared to conventional diesel. This represents an almost twofold improvement over biodiesel made from rapeseed oil, which is already an extremely environmentally friendly solution. Almost 80% less CO₂ is emitted compared to conventional diesel.

Fischer Boel had previously expressed her opinion explicitly and the subject came up again as a clear indication that short-term, one-sided discussions will not prevent the EU Commission from improving the climate situation via the promotion of biofuels.

Representatives of the RETHMANN Group used the inauguration of the joint Danish-German project as an opportunity to point out to the EU Commissioner that this second-generation biodiesel made of animal waste cannot be produced or used in Germany – to the detriment of the German agricultural and meat industries. Since 1 January 2007 it has been excluded from being used as replacement fuel because although fatty methyl esters meet the European biodiesel standard, due to a single criterion (which is not relevant for its use) they do not comply with the German biodiesel standard. This standard became effective at the start of 2007 with the intention of preventing palm biodiesel imports. In addition, contrary to EU demands and the practice of other European countries, many usable waste materials are not recognised as biomass in Germany and therefore cannot be used as a basic material in biodiesel production. Furthermore, from 2012 it will be illegal in Germany to use any animal fats for biodiesel production.

SARIA’s spokesman for the Management Board, Dr. Kurt Stoffel, called on the Commissioner to draw the German government’s attention to this undesirable development, which is bad for the German agricultural and meat industries and runs counter to EU demands and the practice of other European countries, many
Energy from food waste

An energy source of the future

The idea of generating electricity and heat from food waste can take some getting used to. ReFood’s trucks are visible on our roads with pictures adorning the sides showing a chef and a greengrocer disposing of food waste in green containers. What happens to it?

Until the end of 2006 a liquid feed for fattening pigs was made from food waste, an extremely sensible application which farmers had been using successfully all over the world for centuries. The EU ended this practice, however, and new uses had to be found.

Generating energy was the next best solution. As a result, food waste is collected from restaurants, cafés, snack bars, pubs, catering establishments and companies, supermarkets and canteens and processed into a sterilised mass at ReFood plants. This in turn is fermented at biogas facilities. The resulting methane gas is used in combined heat and power plants to generate electricity and thermal energy. Both are primarily used to supply our own production facilities. Surplus energy can be fed into the power grid or used to heat buildings.

The remaining fermented waste is a valuable fertiliser for agricultural use (see article on page 28 onwards).
Services that are part of daily life

Safe, fast and hygienic disposal of food waste and animal by-products
The core services performed by SARIA Group companies include the collection, processing, use and/or disposal of organic waste created by the restaurant and catering trade, abattoir operations and in agriculture. This encompasses food waste, as well as fallen animals and abattoir by-products requiring disposal. The common feature is that the materials need to be disposed of quickly, safely and hygienically.
Leftovers and food waste

Joining a ReFood collection vehicle on its rounds

Many people would like to know about the service behind the friendly chef and the young woman pictured on more than 180 ReFood trucks on Germany’s roads. As the slogan indicates, it’s all about food waste.

I wanted to find out more and joined a collection vehicle that operates out of the ReFood site in Münster. “How does Tuesday sound?” “Fine.” “We start at 3 in the morning...!” That really is early, I thought, as I set my alarm clock for 2.00 a.m. On the way to the site I have a chance to admire the wildlife population of the agricultural landscape around Münster: deer, hare, pheasant and yet more deer.

Willy Strotbaum is the friendly driver I will be accompanying on this early-morning shift. He takes time to inspect the list of customers he needs to visit that morning. He transfers the data to his handheld device – and we’re ready to go. The truck is packed with around 150 120 l, 240 l drums and oil containers which will be swapped for the full containers we are due to pick up.

At 3.20 a.m. it’s time to make the first stop. A 240-litre container is collected that’s so heavy it’s virtually impossible to move. Hmm, this could be fun, I think. The truck continues its round through Münster and then on to Greven, Emsdetten and Nordwalde before returning to Münster. The driver is able to spot whether containers have been put out or not in even the darkest corners. With great skill he reverses his truck into narrow backyards, up ramps and into pedestrianised zones which are still deserted at this hour. “At 9 o’clock you wouldn’t get through because of the commuter traffic. That’s why we have to start so early,” says Strotbaum. What’s more, it wouldn’t be possible to leave containers of food waste outside some restaurants and cafés later than 10.00 a.m. because customers would already be sitting outside next to them. For this reason the list of collection points is arranged by desired pick-up times, as well as to create the most efficient route.

Willy Strothbaum drags containers out from restaurants, snack bars, restaurant chains, catering companies, party services, works canteens, bakeries, supermarkets, farmers’ cafés, etc., and repeatedly rearranges the load space so that the full containers are at the back and the empties are at the front, ticking off each collection on his handheld as he goes. “There’s no need to go jogging in the evenings after this,” he tells me after having spent 15 minutes grappling with some tricky containers.

It sounds easier than it is. Some of places the containers are kept are far from easy to access: dark sheds, concealed side entrances, basements, backrooms accessible only with a key (Strotbaum’s bunch of keys is a sight to see) or in refrigerated storage rooms.

Sometimes the containers need to be wheeled some considerable distance across cobbled streets, which provides a wake-up call now and then, especially in some streets in town centres. Occasionally it’s necessary to empty additional buckets into the ReFood containers as well. In other places there are large sacks of packaging to collect.
And what’s inside the containers? Well, they contain everything left over from eating or preparing food. With restaurants it’s mainly food waste, leftovers, spoilt food and sometimes used frying fats and waste cooking oil. At retail outlets, it’s primarily items being thrown away from the vegetable or meat departments, out-of-date packaged food or items that have defrosted. A very wide variety therefore – but nothing that’s fit for human consumption.

Until the end of 2006, in Germany this material was turned into excellent feed for pigs, as was the case for centuries on every farm. In accordance with EU legislation, since the end of 2006 this waste is now sterilised first and then converted into biogas at fermentation plants. This is then used to generate heat and electricity in combined heat and power plants. The fermented waste serves as a high-grade NP fertiliser.

At 11.30 a.m. Strotbaum and I arrive back at base. The containers now need to be unloaded and wheeled to the tipping area for emptying. The empty containers then pass through an automated washing system where they are washed at 65°C before being disinfected. Strotbaum then drives his vehicle back to the loading ramp and fills his truck with the corresponding containers for his second run.

All I can say is that I have the utmost respect for him and his colleagues! oma

Willy Strotbaum, a driver at the ReFood site in Münster, collecting containers of food waste.
SecAnim: An essential service

Fast, hygienic, traceable – and efficient

The importance of the service provided by SecAnim only really becomes apparent to outsiders when there is an animal epidemic and they see television images of farms cordoned off and men dressed in protective suits. Then the main question is "Who’s fixing the problem?"

The animal by-products described here not only derive from animals affected by an epidemic but also from ordinary fallen animals in the agricultural sector, as well as abattoir by-products – which make up the bulk of animal by-products for disposal.

SARIA subsidiary SecAnim performs collection, processing and safe disposal services by deploying approximately 180 collection vehicles in Germany from sites in Lünen, Malchin, Mützel, Elxleben, Detmold, Linnich (logistics), Schwerz (logistics), Schwalmtal-Hopfgarten (TBA Schäfer) and Hüttenfeld (SÜPRO). SARIA Group companies in Austria, the Czech Republic, France, Poland and Spain also provide these services.

The primary objective is to remove animals or abattoir waste quickly and hygienically. As a rule, collection takes no longer than 24 hours from the time of reporting. This is especially critical during the summer months. The same procedure is followed at all SecAnim plants when processing category 1 and 2 materials: delivery, in some cases sampling, crushing, sterilisation (at 133°C, 20-minute exposure time and pressure of 3 bar), defatting, drying. The end products are category 1 and 2 meal, plus category 1 and 2 fats.

There are two key factors to bear in mind: category 1 meal may only be incinerated or used to generate energy and is therefore not available for any other commercial activity. Category 2 meal can also be used as fertiliser if desired. ○ cmr

These products can now be used for various applications in line with EC Regulation 1774/2002.
Fish conference in Concarneau

An opportunity to share experiences in Brittany

In May, the SARIA Management Board met managers from the three SARIA processing sites in Arteixo (Spain), Concarneau (France) and Cuxhaven (Germany) for detailed discussions about the production of fishmeal and fish oils.

The presentations and subsequent discussions quickly showed that production activities at the three locations focus on different aspects, thereby resulting in distinctive approaches to sales. However, all attendees discovered how important it is to share experiences outside regular sales meetings. Hearing about the specific experiences of other SARIA countries in terms of process design and management, as well as specialising in different raw materials and products, meant everyone gained new insights. All the participants at this first SARIA fish-related event were surprised at how effectively everyone managed to communicate in English. A tour of the plant also demonstrated how much the Concarneau site has changed in the past two years following a complete redesign to integrate processing from the former Lorient site.

ReFood conference in Mützel and Genthin

ReFood – a core activity for the SARIA Group

A biogas conference brought SARIA managers together in Mützel from virtually all SARIA countries. The aim was to present the full range of ReFood Deutschland’s business activities at one of the main ReFood sites.

A tour of the biogas facility in Genthin and the nearby ReFood site in Mützel, which handles complex extraction processes, provided valuable practical insights to supplement the day’s presentations and discussions. The focus was on the value chain as a whole, from the collection of ReFood’s raw materials – food waste, out-of-date foods and faulty batches from the food industry – and producing a fermented substrate for generating biogas to biogas production itself and using the fermented residue as an agricultural fertiliser. All attendees found that ReFood Deutschland’s expertise, acquired over many years, could be applied to their own activities. Presentations on SARIA France’s biogas projects and the ReFood activities of SARIA Poland underlined the fact that these areas are becoming core activities for the Group beyond Germany, in line with corporate strategy.
International expansion requires language skills

Employees encouraged to learn English

The SARIA Group has a presence in many European countries and is operating in an increasingly global environment. All technical staff and managers need to adapt to the international stage and should ideally be able to communicate adequately in at least one other language – English – in addition to their mother tongue.

Communication with business partners and customers, as well as SARIA colleagues from other countries, must not be impeded by not being able to speak at least English in addition to one’s mother tongue, as Dr. Kurt Stoffel, Spokesman for the Management Board of SARIA, told recent conferences for French and German managers. Since the Management Board made it clear that English is an essential tool for SARIA managers whose work involves them in any way with other countries, numerous SARIA employees have started to improve their knowledge of English. Some have found intensive courses offered by CERAN in Spa (Belgium) or Warwick (UK) beneficial in making good progress in a short time, while others are taking private lessons or evening classes to gain the necessary skills in this important area. “It was demanding but extremely intensive and really good for my work in international biodiesel sales,” said Reinhard Willmer of eco-Motion on his return from Warwick, where he spent a week being drilled in English.

Commissioning a new processing facility for animal by-products in Belarus

SARIA Bio-Industries Belarus in Bereza

Bereza, a medium-sized town with some 30,000 inhabitants, is situated approximately 100 km to the east of Brest (on the border between Poland and Belarus) on the E30 motorway, which runs from Warsaw to Moscow via Minsk. On 8 August a new SARIA processing facility for animal by-products came on stream here on a greenfield site.

The Chairman of the Supervisory Board of the RETHMANN Group, Norbert Rethmann, cut the red ribbon to officially open the plant at a ceremony attended by members of the Belarus Chamber of Representatives, representatives of regional government, the local authorities, the German embassy and some 150 guests. In his speech, Rethmann emphasised that based on SARIA’s decades of experience the company would be seeking to operate a plant here that meets European standards and which provides an optimum service for agricultural and abattoir operations. The company has invested 15 million euros in Bereza and already provides jobs for 40 committed employees. During the next year the plant will reach its processing capacity of up to 40,000 tonnes per year, creating around 70 jobs in total. All speakers expressed themselves delighted with the impressive facility and confident of a successful future.