CABLEWORLD
MAGAZINE FOR LAPP GROUP CUSTOMERS

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FOODSTUFFS

INSIGHTS INTO THE FOOD AND BEVERAGE INDUSTRY

EAT, DRINK AND ENJOY

Dear readers,

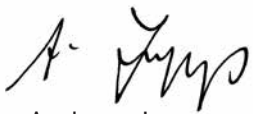
A slice of wholegrain bread topped with cream cheese and apricot jam, along with a nice cup of herbal tea – and what did you have for breakfast this morning? I'm sure you'll have no trouble answering that question. After all, we know what we are eating.

But sometimes we just don't quite know where our food comes from.

By that I am not talking about whether food is good or bad, or whether it's flown in from overseas or produced locally in the field down the road. What I mean is the production and research facilities – the production of, and research into good and affordable foodstuffs. And even if consumers would rather not give it too much thought, we as a company are aware: many things that end up on our tables first have to make their way through a factory hall. A large proportion of our food is industrially manufactured. And industry always relies on technology. In a highly sensitive sector like the food and beverage industry, there are of course also very special standards to uphold for the technology and components. Standards which we meet in the Lapp Group as a partner of the foodstuffs industry – and which are the focal point of this edition of Cable World.

On that note, I hope that this edition, like your food, is to your taste.

With best regards,



Andreas Lapp

COVER STORY

FROM THE CABLE WORLD

IN THE SPOTLIGHT

PUTTING HYGIENE FIRST: THE CHALLENGE FOR FOOD TECHNOLOGY.

"THE MILK MAKES IT" ("DIE MILCH MACHT'S") – THIS WAS A LONG-RUNNING GERMAN ADVERTISING SLOGAN. "HYGIENE MAKES IT" – THIS COULD BE A GOOD WAY OF REWORKING IT TO REFLECT THE STRINGENT REQUIREMENTS OF THE FOOD INDUSTRY. AFTER ALL, FEW ECONOMIC SECTORS HAVE HYGIENE STANDARDS AS HIGH AS THOSE IN THE FOOD AND BEVERAGE INDUSTRY. WHEN A CONSTANTLY GROWING AND INCREASINGLY URBANISED WORLD POPULATION NEEDS TO BE SUPPLIED WITH FOOD, NOT EVERY CONSUMER IS ABLE TO COLLECT THEIR MILK STRAIGHT FROM THE FARM OR GROW THEIR OWN VEGETABLES AND GRAINS. THE HEALTH AND SAFETY OF MILLIONS OF CONSUMERS DEPENDS UPON HIGH-QUALITY FOOD AND BEVERAGES, SO IT IS ONLY RIGHT THAT THE HIGHEST QUALITY STANDARDS APPLY HERE – BOTH FOR END PRODUCTS AND THE TECHNOLOGY USED TO PRODUCE AND PROCESS THEM.

Food is a basic human requirement for survival. This makes the food and beverage industry one of the most significant economic sectors, and also one of those that is monitored the most critically. Not only by the growing number of conscious consumers who want to know what they are actually eating, but also through the strict self-imposed standards in the sector. After all, no one wants a food scandal – neither the industry nor the consumers.

Nowadays, milk is processed in a completely different way to meat, and confectionery is packaged in a completely different way to beverages. This means that, from the Lapp Group's perspective, the food and beverage industry represents a multi-faceted challenge and at the same time a highly demanding one. Production processes are, as it happens, just as diverse as the flavours of products – and yet there's still one clear common denominator: optimum hygiene. The strict cleanliness requirements which are present in the food processing industry are also consistently applied to the electrical components.

WHAT COMPONENTS NEED TO BE ABLE TO DO

The requirement profile for cables and connection solutions concerning food and beverage production and filling and packaging systems is correspondingly high. This is because the products here need to have a lot of things put into them but they are not to dispense anything under any circumstances – after all, who would want to find outgassing from plastics or even "material samples" in their food? They must be resistant to a very wide range of chemical, thermal and physical loads so that they can also be used, for example, in refrigerated areas and damp environments.

Additionally, a cable for the food industry has to be particularly tough – and really robust upon contact. This is because it comes into contact with fresh water and industrial water, as well as wine and beer, vegetable oils and animal fat, and with cold and warm ingredients. It is self explanatory that the technical components behind the scenes in the food industry need to be free of evaporating substances such as plasticisers and that food must not be contaminated under any circumstances.

At the same time, the connection technology has to be easy to clean and be cleaned on a regular basis – often under high pressure or with hot steam jets. Furthermore, cables and connections in this sector also need to demonstrate their resistance to aggressive acidic and alkaline industrial cleaning agents.

At the Lapp Group, we have taken all this on board – and have consistently implemented this in professional connection solutions for a diverse range of applications in the food and beverage industry. With the help of the company's own laboratory and testing facilities (see page 20) we have often gone beyond the high requirements of the food and beverage sector.

FOOD & BEVERAGE = HYGIENE & RESISTANCE.

In the food industry, technical components not only need to withstand mechanical and physical impacts, they also need to meet these criteria:

- compatibility with and resistance to process materials
- chemical and mechanical resistance in regular cleaning processes

THE MILK OF TOMORROW.

IN THE INSTITUTE OF FOOD SCIENCE AND BIOTECHNOLOGY AT THE UNIVERSITY OF HOHENHEIM, GERMANY, THE WORLD OF DAIRY PRODUCTS IS BEING TURNED ON ITS HEAD AND GIVEN A RETHINK. AND IN A PRACTICAL, RATHER THAN ACADEMIC, THEORETICAL WAY. THIS IS BECAUSE THE OUTCOME IS INNOVATIVE PRODUCTS AND PROCESSES FOR THE FOOD INDUSTRY. A VISIT TO THE DAIRY FOR RESEARCH AND TRAINING.

It's an unusual university: the dress code is white, the cling film is 300 metres long – and how many universities have their own real-life cows? Here in Hohenheim they even have their own farm. With professor Dr.-Ing. habil. Jörg Hinrichs as its head, one of the small number of dairy science technology sites in Germany was established here. Connected with the affiliated institutes such as nutrition, food chemistry and nutritional medicine, Hinrichs sees his institute as being right in the middle of the "from farm to fork" chain.

He proudly talks about his former students who obtained their doctorates here and now hold important positions in business – and about how they are now putting into practice what they learned during their research at Hohenheim and transferring it to the world, and to supermarket shelves and refrigerators. Ultimately the central factor in the research activities is practical relevance. This is demonstrated not least by the many collaborative research projects with the dairy industry.

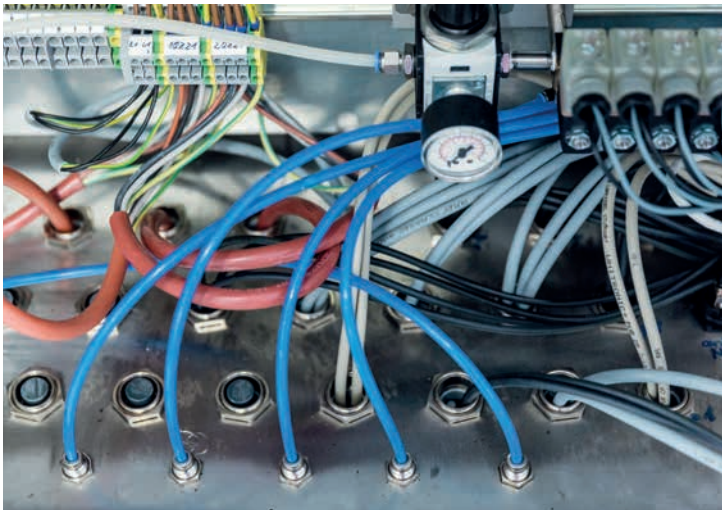
WHEN DAIRY BECOMES SCIENCE

Since 2001, Jörg Hinrichs has been the head of the subject area "food from animals" (whose profile he has now changed to "soft matter science and dairy technology"), which includes dairy for research and training. The knowledgeable dairy expert has milk in his blood like automotive engineers have petrol in theirs. His grandfather and father were both dairy managers. Now, in Hohenheim, Hinrichs is uniting biology, chemistry, physics, engineering and an irrepressible drive to research. This combination is helping companies to better gauge whether certain processes are at all economically viable.

PAGES 6 – 7 Professor Jörg Hinrichs researches in order to makes processes more efficient and open the doors for new technology

THE ENERGY DRINK

Every hour, 1,000 litres of milk are pasteurised here. Until recently, it was even possible to purchase the white energy supplier afterwards in the university shop. The multi-talented milk contains more than 500 components – some of which are highly functional, non-synthesisable substances which are used in an enriched form in medicine, for example.



"Here we can ultimately help to make things more efficient or open doors to new technology." Like what, for example? A whey-based drink with enzymatically generated lactulose for mobilising the digestion of people in special life situations. What sounds like the title of a thesis is actually a product for elderly people that can be used in nursing homes to aid digestion.

TEXTURE: RECIPE FOR SUCCESS

Another question that people here are intensively researching: what makes the texture of food appealing? After all, to achieve market success with dairy products, one of the main factors, in addition to taste and smell, is texture. For example with the low fat trend.

"If there is no fat in it, you need something else to create a creamy texture", explains Hinrichs. "You can of course make Camembert using little fat. But it's like an ice hockey puck." However, with so-called interfering elements it is possible to alter elasticity and flow behaviour.

Hinrichs' working group is also concerned with the optimisation of systems and processes. "Food safety depends on process safety before", he says. And this requires reliable components. This is where Lapp comes into the equation.

SMALL COMPONENTS, HUGE REQUIREMENTS

Even the smallest components like connectors are highly significant to professor Hinrichs: "The connection technology must work reliably in these tough conditions. It is cleaned in research just like it is in industrial practice. It is necessary to clean the system below the surface as well. And that means they need reliable resistance to acids and alkaline solutions."

Incidentally, the cleaning of the research dairy according to strict hygiene requirements is deliberately not outsourced. Such a precarious task cannot be performed by an external company; it is carried out by budding scientists here. So the same goes for cleaning as for the components which have to withstand this process: professionals are needed on both sides.

INFO ON DAIRY TECHNOLOGY

Dairy technology is a tradition in Hohenheim. As early as 1822, not only distillation and vinegar production were taught here but also cheesemaking technology. With the construction of a dairy in the year 1883 and the founding of the "research centre for milk and dairy products", the foundations the for dairy research were laid. Since 1967 there has been the university course "food technology".

THE FOOD TASTER

WHEN HE HAS TO, HE ALSO SAMPLES FOOD FROM THE 3D PRINTER. AFTER ALL, UDO POLLMER CONCERNS HIMSELF WITH THE FUTURE OF FOOD. THE AUTHOR, FOOD CHEMIST AND HEAD OF THE EUROPEAN INSTITUTE OF FOOD AND NUTRITION SCIENCES ON RAW FOOD, MAKING USE OF LEFTOVERS AND THE OMNIVORE HUMAN.

Vegan, vegetarian, raw food and other such things: are they the result of intolerance to certain foods, a new consumer conscience, or are they just trends?
These fads will accompany society like flu viruses and so far there has been no vaccination for them. People who genuinely have food intolerances don't make a song and dance about it, they're more likely to be embarrassed about it. They know, after all, that there's generally something on every table that they can eat trouble-free.

How is it possible to handle resources and our environment responsibly and efficiently in food production?
By making use of leftovers. Ten years ago, half a pig would be incinerated because nobody wanted those parts and their use as animal feed was prohibited. Today, thanks to globalisation, nothing gets thrown away any more, it is sold around the world instead. What we regard as "inferior", such as curly tails, is seen in other places as a sought-after delicacy. But the opposite is true too: due to its high energy value, stale bread is used to heat up ovens in bakeries.

Is there such a thing as good industrially produced food?
Yes – or do you happen to produce mozzarella, mayonnaise and soused herring yourself? There are excellent additive-free frozen ready meals without any sort of added aroma, organic beers without the typical purity requirement chemistry and also high-quality chocolate.

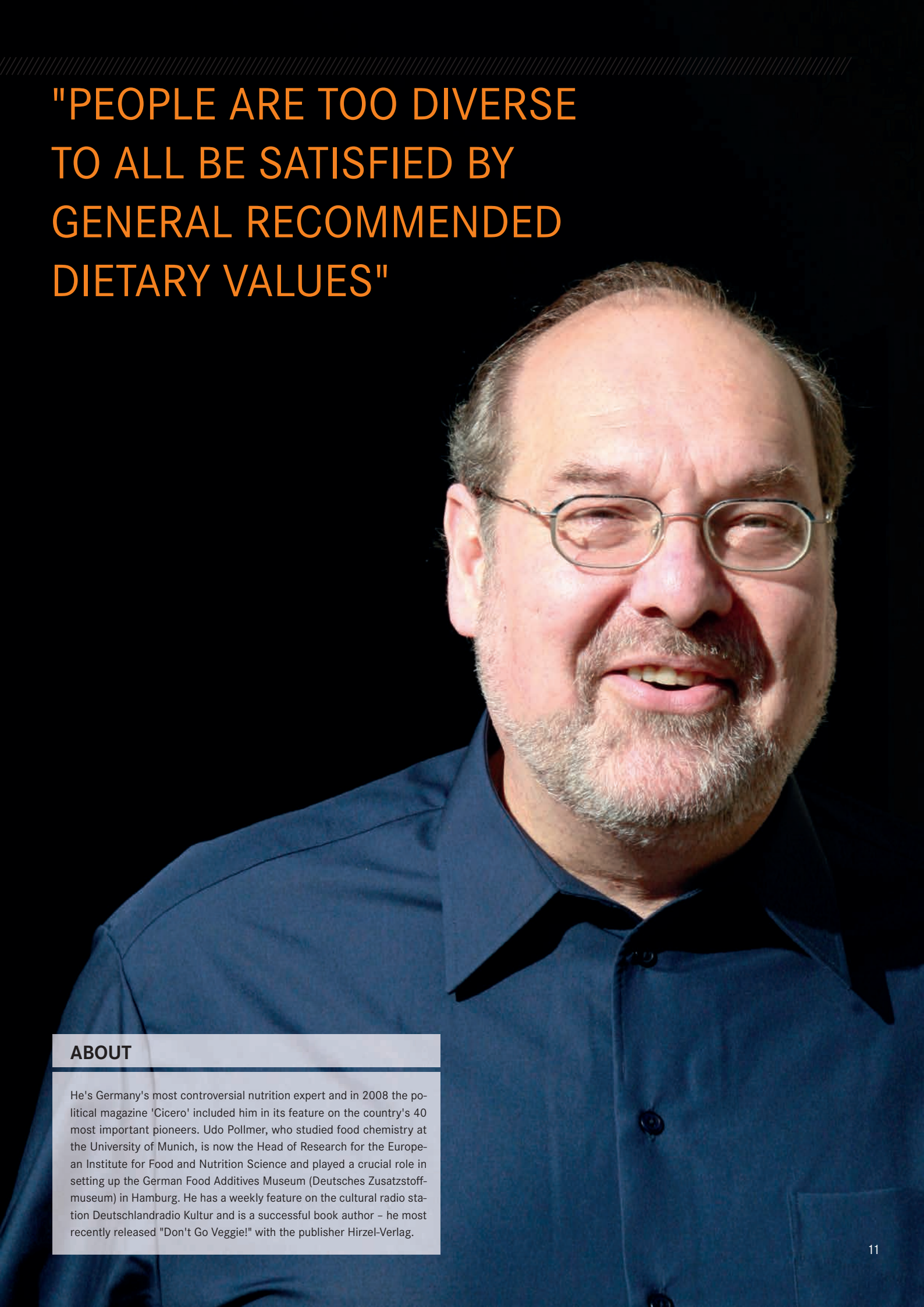
Nutrition needs research, not only into new tastes, but also new answers to the question: what will we eat in the future?
Either people will be eating what they are accustomed to eating or there will be political unrest. Agriculturally speaking, it is not a problem to feed even 10 billion people – as long as we don't give up meat. According to statistics from the Food and Agriculture Organization of the United Nations, over 60% of the available agricultural land is suitable solely for livestock farming. Veganism is a first-class ticket to a global hunger crisis.

What nutrition advice do you see as obsolete? And what is as relevant as ever?
The notion of "healthy nutrition" is obsolete. People are too diverse to be satisfied by general recommended dietary values. The knowledge that man is a mammal is becoming increasingly important: an omnivore amongst mammals and a "coctivore" – meaning a mammal that only eats prepared food – amongst omnivores. You only need to think about how much smaller our jaws are than those of anthropoid apes to see that our evolution is shaped by our meals.

What food really whets your appetite, and what puts you off eating altogether?
My appetite comes along when a good, experienced chef carefully conjures up a delicious meal. And it goes when some so-called nutritionists with diplomas come along and impart their ignorance to the guests.

Photo: Karl-Ludwig Leiter

"PEOPLE ARE TOO DIVERSE TO ALL BE SATISFIED BY GENERAL RECOMMENDED DIETARY VALUES"



ABOUT

He's Germany's most controversial nutrition expert and in 2008 the political magazine 'Cicero' included him in its feature on the country's 40 most important pioneers. Udo Pollmer, who studied food chemistry at the University of Munich, is now the Head of Research for the European Institute for Food and Nutrition Science and played a crucial role in setting up the German Food Additives Museum (Deutsches Zusatzstoffmuseum) in Hamburg. He has a weekly feature on the cultural radio station Deutschlandradio Kultur and is a successful book author – he most recently released "Don't Go Veggie!" with the publisher Hirzel-Verlag.

WHEN GOOD ISN'T GOOD ENOUGH

THE MOST DEMANDING AMBIENT CONDITIONS, THE HIGHEST HYGIENE STANDARDS, PERMANENT RESISTANCE – THERE ARE VERY SPECIAL REQUIREMENTS FOR A CABLE GLAND IN THE FOOD INDUSTRY LIKE THE SKINTOP® HYGIENIC. THEY ARE PARTICULARLY STRINGENT.

It is specially designed for food and beverage production and it can optionally also be used in the pharmaceutical industry – two areas in which hygiene is at the top of the agenda and good is nowhere near good enough. But how do you make a cable gland for electrical and electronic connections suitable for the highly hygiene-sensitive food industry?

The answer: it all starts with selecting the right material. In the case of the SKINTOP® HYGIENIC, class V4A stainless steel is used for the stainless steel body because it guarantees permanent corrosion protection and is able to withstand harsh conditions even in the long term. This, along with the use of sealing materials suitable for foodstuffs, makes the cable gland suitable for direct contact with food in production.

The accompanying sealing material is one of the Lapp Group's new developments: a special elastomer certified by ECOLAB®.

HOW DESIGN GUARANTEES HYGIENE

But it was not only the material that was central in the development process, the design was too. With the SKINTOP® HYGIENIC, the aim was to design a product without any corners or edges. This is because a cable gland in this sensitive area has to minimise the amount of 'attacking surface' where impurities can accumulate. Therefore all seals are moulded to seal the gaps between components perfectly without creating any cavities. All threads are also fully covered. Additionally there is no hexagon on the cable gland – instead, each one has two flat surfaces to which screws can be fixed. Corners, edges, cavities and grooves in which microbes might settle are prevented in this way. Additionally, both flats were rounded and the surface roughness was minimised because microorganisms can settle on rough surfaces and biofilms can form. "Hygienic Design" is the term for it – and it is possible thanks to a complex production process involving CNC milling machines in which great importance is placed on achieving precision, low tolerances and good surface quality.

LOAD TESTS PASSED WITH FLYING COLOURS

The SKINTOP® HYGIENIC has earned its name then – as well as three special certificates:
the cable gland has FDA approval, as well as others. That means that the materials used are permitted by the U.S. Food and Drug Association, being classed as harmless.

Additionally it has the so-called ECOLAB® certification which attests to the resistance of SKINTOP® HYGIENIC to cleaning agents. As well as this chemical test, it also passed a mechanical load test for sealing ability and strain relief and was also tested for material ageing.

The SKINTOP® HYGIENIC was ultimately also successful in what might be the toughest test of all: the so-called EHEDG certification by the Weihenstephan Institute in Freising, Germany. In the autumn of 2014, it became the first ever product to be subjected to the new, more stringent testing procedures. Previously the certificate was awarded solely based on theoretical testing where CAD drawings were examined and material lists were monitored – the new, more demanding testing simulates extreme conditions in practice.

The test specimen is immersed in a closed piping system under pressure using a test medium. A nutrient solution loaded with bacteria is introduced and, as experts say, incubated. At the end, the components are cleaned and tested for contamination. To pass the testing, they must demonstrate that they are free of residue and that no liquid has permeated. Additionally, after the cleaning process there must be no evidence of germ or bacteria formation.

The Lapp cable gland also passed this resilience test with flying colours and can quite rightly be called HYGIENIC – and it can live up to its name while being used anywhere in the food and pharmaceutical industries.

INFO

The surfaces of the SKINTOP® HYGIENIC are particularly smooth to make it harder for microorganisms to settle there. It becomes clear just how important this is when we consider how over an eight-hour working day one single bacterium multiplies to produce nearly 17 million bacteria.

GOOD THINGS TAKE TIME TO RIPEN

Since 2012, the Food & Beverage division of the Lapp Group has been consistently growing and expanding. That's **3 years** or **1,095 days** or **26,280 hours.** This, incidentally, is just how long it takes for good, hard Parmigiano-Reggiano cheese to finally achieve that full, nutty taste.

26,280

AT THE MOUNTAIN PEAK

WITHIN THE LAPP GROUP, THE FOOD & BEVERAGE DIVISION IS AS YOUNG AS IT IS SUCCESSFUL. AND WITH THE TWO PRODUCT MANAGERS CORNELIA KUNTZER AND ANDREAS BAUER IT IS ALSO IN VERY GOOD HANDS.

"My colleagues", Cornelia Kuntzer replies straight away when asked what she likes most about Lapp. And also the great collaboration, the freedom she has in making decisions and in particular the chance to conquer new territory. New territory such as the food and beverage industry which, since 2012, has been pressed ahead with here consistently. "How can we make applications even more straightforward and safe for our customers? And how can we help our customers to make their own machinery even better?" states Andreas Bauer – Head of Product Management, System Products – regarding his department's approach to the topic.

It is a topic where something as small as a cable gland can be crucial for something as big as safety. Standard products needed to be adapted and new solutions needed to be developed. A product range which involves developing products in just three years which are to be used in the field for decades; Andreas Bauer calls that ambitious – but manageable. As long as you focus on the crucial questions:

Which market needs what? What regulations are there? What is the right design? Which materials are ideal for the application? This ensures that products live up to their promises. "When people purchase products from us, they ultimately expect quality", says Bauer.

SOLUTION-BASED THINKING

"There have sometimes been products which could fully perform technically", Cornelia Kuntzer adds. It's just that they weren't specially tested according the requirements of the highly sensitive food and beverage industry. "But we wanted a product range that has the most important approvals and testing." In this instance, it was important to have the ECOLAB® certification for resistance to cleaning agents, the EHEDG approval for the design aspects and FDA for the material tested.

With the release of the SKINTOP® HYGIENIC cable gland in November 2014, which has these certifications, the product range is well rounded. Now all areas needed in food production systems have been covered.

This fits in perfectly with the Lapp philosophy, thinking in terms of solutions, not components. Solutions where cables, connectors and, of course, the cable gland need to work in perfect harmony and come from the same supplier.

Three years down the line, Andreas Bauer sums up: "We've now made it to the top of the mountain: 'Mount Food & Beverage'. And we've set up base camps, from market research, to the first design projections, right up to the final product. When you are standing up there at the peak for the market launch and see the trail left behind you, it really motivates you to take on the next challenge."

IN THE LAPP LABORATORY

"WARNING – TEST RUNNING!" STATES THE SIGN – WE'RE STILL ALLOWED TO TAKE A QUICK LOOK THOUGH. BETWEEN X-RAY FLUORESCENCE ANALYSIS, A STRIPPING TEST DEVICE AND A REFRIGERATOR FOR COLD IMPACT TESTS LIES A STRANGE COSMOS. A VISIT TO THE LAPP LABORATORY.

They say you can't make an omelette without breaking eggs. And you also can't test a product without some flashing, glowing, swooshing and whirring along the way. Here the products from the Lapp Group are tested behind closed doors for everyday suitability. And sometimes a regular day turns into years here – for example if a cable needs to be tested for ageing properties. But how on earth can you artificially age a cable in a laboratory? The answer: in a heating cabinet that can simulate many months in a matter of days.

Up to 40 different tests are performed on a single cable, depending on where it will be used. If the location is an oil platform then drilling mud from Scandinavia will also sometimes be used. "There are enough challenges", says Michael Hagenmüller. He is the head of the laboratory and has also subjected the SKINTOP® HYGIENIC to rigorous testing.

In this case it was necessary to monitor construction and measures, check the threads, test for anti-twist protection, check strain relief and ensure that the connector is watertight and dust-proof – among other things. A negative pressure is produced for 8 hours at a time and talcum powder is added. At the end there cannot be even a single speck of dust. Only then does it pass the test.

NOT ROCKET SCIENCE? THINK AGAIN!

At another station the cables, connectors and cable glands are tested for chemical resistance. That might not be "rocket science" – but with the critical eyes of Laura Erdmann present, it strangely sort of is. After all, when she's not here, Laura Erdmann is studying aerospace engineering. She painstakingly prepares the material tests – and braces herself for long test phases. The ECOLAB® test, for instance, takes four weeks.

ECOLAB® is a leader in the area of industrial cleaning products for hotels, restaurants, hospitals and of course also food manufacturers and breweries. In these places, chemicals are normally used to clean machinery. The ECOLAB® certification attests to the fact that the Lapp products are resistant to these cleaning agents and disinfectants.

"For the customers, what we're doing here is extremely important. They can rest assured that the figures listed in our catalogues have been tested and verified", explains Hagenmüller who has already set up or helped set up various laboratories for Lapp in Stuttgart, Singapore and other places in the world.

At the moment, he is working on an idea on how the Lapp laboratory can continue setting standards for the sector in future.

INFOBOX ECOLAB® TESTING

For the ECOLAB® certificate, products are fully immersed in **6 different test solutions** for **28 days**. They are visually monitored every **2 days**: for soaked or brittle surfaces, colour changes and defects such as cracks. If no tags are visible after **4 weeks** and the products pass the following functional tests, the product can be classed as resistant.

FOOD FACTS

EARNING YOUR BREAD AND BUTTER WITH BREAD AND BUTTER

Nearly **5 million** people work in the German food industry. The sector's **717,000** companies generate around **7%** of Germany's gross added value.

THE ENLIGHTENED CONSUMER

54% of people think that it is important for food to come from the region. For **48%**, the way that animals are reared matters. **51%** pay attention to the indications of origin. **78%** of people get at least occasionally peeved by information on food packaging (e.g. additives, best-before dates).

FOOD'S READY

Around **80%** of German food exports go to other EU countries – the largest consumers outside of the EU include Switzerland, the USA, Russia and China. The most popular exported goods are meat products, confectionery, beverages and dairy products such as cheese.

THE ROBUST TYPE

The ÖLFLEX® ROBUST cable certainly lives up to its name when it comes into contact with water, fruit juice, wine, beer or lemonade. And in contact with hot steam it demonstrates a service life more than **ten times** greater than that of a normal rubber or polyurethane sheathed cable.

IS ORGANIC UNPOPULAR?

Organic products only account for **2%** of all food sales in Europe. Swiss people spend the most on ecologically produced food (**€189**/year), followed by Danes (**€159**), Luxembourgers (**€143**) and Austrians (**€127**).

APPETITE SUPPRESSANTS

According to the Food and Agriculture Organization of the United Nations, there are approximately **1,400** edible species of insects. But in Europe, exotic snacks such as grasshoppers are rarely on the menu.

BITE-SIZE STATISTICS

Number of loaves of bread that the average German eats in a lifetime: **5,192.** Average amount spent on fruit and vegetables per year in euros: **271.** Percentage of people whose preferred day for food shopping is Saturday: **56.4**.

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