2015 Protein Trends & Technologies Seminar

Highlights: Business Strategies

Note: This digital magazine, initially posted at https://GlobalFoodForums.com, is now at https://foodtrendsntech.com/global-food-forums-magazines

A Global Food Forums, Inc. Event

www.GlobalFoodForums.com

2015 Protein Trends & Technologies Seminar
Business Highlights Report

Global Food Forums, Inc.'s third annual ***Protein Trends & Technologies Seminar*** was held in Oak Brook, Ill., USA. A Pre-conference: Business Strategies program was held on May 5, 2015, followed by a Technical Program: Formulating with Proteins on May 6th.

Speakers at the Pre-conference provided information for upper-level managers to help them guide their company's protein ingredient business, and for those for whom the protein ingredient marketplace has significant impact on new product development strategies and/or their operations. Total registrations for the Pre-conference and Technical Program: 231.

Industry experts offered insights into consumer and product trends, market volatility, global regulations and emerging market opportunities, among other topics. Highlights from the Pre-conference's seven speakers are provided here in the form of key points and charts.

Attendees could register separately for the Pre-conference program or also for the next day's Technical Program: Formulating with Proteins, for a cost savings. The 2015 Protein Trends & Technologies Seminar's Technology Program: Formulating with Proteins Report, its Business Strategies Highlights and the speakers' PowerPoint presentations may be downloaded from www.GlobalFoodForums.com/2015-protein-seminar/store.

We hope to see you at our 2016 Protein Trends & Technologies Seminar, May 3rd and 4th, 2016, Oak Brook, Ill., USA. www.GlobalFoodForums.com/2016-protein-seminar.

Table of Contents

The Quest for Protein: Challenges and Opportunities

Factors that shape animal protein production and consumption trends can be placed into three buckets: disease, competitiveness and trade, said William Sawyer, MSA, Vice President, FAR Animal Protein, Rabobank.

Globally, animal protein consumption has steadily increased. In the last five years, beef consumption has been up only slightly. Pork is the number one animal protein consumed around the world; however, the FAO predicts chicken will overtake pork as the most consumed animal protein by 2020. Consumption is driven by poultry's lower cost and demographic interests that fit with this meat.

China is a huge driver of protein consumption. About 75% is pork—not chicken—due to disease concerns, said Sawyer. Outside of China, chicken shows the greatest growth. Some 43% of this growth has occurred either in the BRIC countries, with their emerging middle class, or in the EU, where Europeans are attracted to the lower price and health aspects of poultry consumption.

Another 38% of growth has occurred either in primarily Muslim countries with great economic growth, such as Iraq, Saudi Arabia, Turkey and Malaysia, or in certain Latin America countries. For example, globally, Mexico is the sixth-fastest growing country in poultry consumption, followed by Argentina.

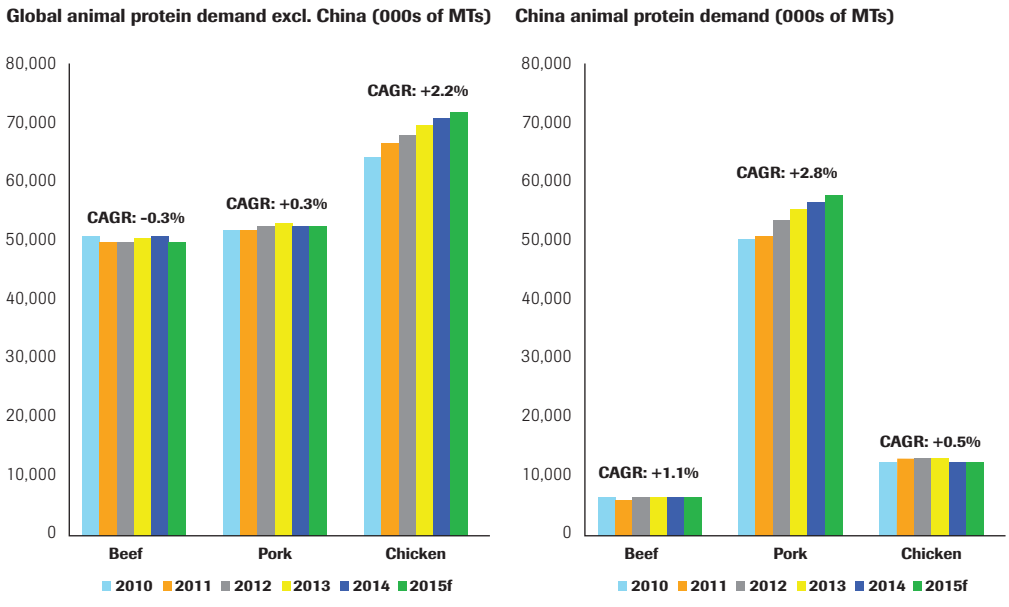
Rabobank finances and closely follows trade around the world, said Sawyer. The export story is fairly simple, with the U.S. and Brazil exporting half of all meat exports; they likely will continue to do so. There are also niche markets, such as India and Australia's export of beef and Canada's export of pork. Overall, meat trade is growing more quickly than consumption. Some regions and countries are more efficient in animal production than others and can afford to export to the latter.

Import trade is a more cluttered picture, with a large number of small countries importing meat. Japan is the number one major importer of food overall and a key importer of meats. They've taken the lead from Russia, which is striving to be more self-sufficient.

From 2007-2014, consumers in Canada, the U.S. and EU shifted away from beef and toward chicken. As the economy has rebounded, the expectation was that they would return to beef—but they haven't. Beef in the developed world is becoming a luxury food, as the beef industry deals with its high cost of production and the subsequent higher sale prices.

In the past, North American analysts tended to not talk about animal disease; it was a problem "in other parts of the world," noted Sawyer. There are two major global meat animal diseases. The first is PEDv (Porcine Epidemic Diarrhea virus), which has significantly impacted the U.S.—but also the rest of the world. Millions of hogs were lost in the U.S. during 2013-2014, with subsequent declines in U.S. hog slaughter in 2014. Hog futures went to all-time highs, reflecting the uncertainty in the industry, said Sawyer.

Animal Protein Consumption Growth Globally and in China



SOURCE: USDA

Avian Influenza (AI or bird flu) is also a global issue. AI had been a China story but is spreading into North America. In Mexico, it is a production issue; in the U.S., it's a trade issue, since the U.S. is losing states that can export. [*Note: since this presentation, AI has greatly impacted the U.S. egg supply.*]

Of great concern is the potential impact of consumer attitudes toward poultry, in that bird flu has caused human fatalities. China has approximately one death per day due to this disease. China has a bright future in long-term growth of chicken consumption and trade; it is the intermediate future that is challenging.

At the end of his presentation (given May 2015), Sawyer concluded that prices overall are stabilizing, which benefits producers, and trade barriers are gradually breaking down. Both disease and currency wars need to be kept at bay. With these factors in place, there is a positive outlook for the animal protein sector in 2016.

William Sawyer, MSA, Vice President, FAR Animal Protein, Rabobank, +1.404.870.8023, William.Sawyer@rabobank.com, www.rabobank.com

Global Protein Regulation– A Question of Quality?

"The match between dietary supply and human protein needs is vital to support the health and well-being of human populations," said Sukh Gill, Llb, DTS, MTSI, Director of Global Regulatory Services, Leatherhead Food Research, while quoting a 2011 FAO Report. However, regulations around the globe take inconsistent approaches to define the amount and quality of dietary protein required by humans.

When an over-simplified regulatory approach is taken in providing information about a food's protein quality or content, less informed choices may result, as that information is used to make decisions on how to meet nutritional needs. More sophisticated approaches to determine protein quality and quantity help level the playing field for making protein marketing claims. Also, global food policies will be able to give higher priority to dietary sources of protein that best deliver against population needs, noted Gill.

In the late 1800s, Johan Kjeldahl developed an analytical method based on a food's nitrogen content to determine protein quantity in grain. His method remains internationally recognized; however, since it includes non-protein nitrogen, it does not always measure the true protein content of a food.

Kjeldahl's method also does not measure a protein's nutritional value, which is related to its ability to satisfy nitrogen and amino acid requirements for tissue growth and maintenance, said Gill. Current thought is that this ability primarily depends on the digestibility of protein and amino acids, and the dispensable and indispensable amino acid composition of the proteins. [*NOTE: The EU and U.S. differ in requirements needed to make a protein claim]* (See chart "EU vs. U.S.: Making a Protein Claim.")

In the U.S., from 1919 until 1993, the Protein Efficiency Ratio (PER) was the method used to evaluate the quality of protein in a food. In 1993, the more sophisticated Protein Digestibility Corrected Amino Acid Score (PDCAAS) rating was adopted by the US FDA and the FAO/WHO (but not the EU) for determining protein quality.

EU vs. U.S.: Making a Protein Claim

Claim	U.S. Requirements	EU Requirements
"High," "Rich in" or "Excellent Source of"	Contains 20% or more of the DV per RACC. May be used on meals or main dishes to indicate that the product contains a food that meets the definition, but may not be used to describe the meal. 21 CFR 101.54(b)	A claim that a food is high in protein, and any claim likely to have the same meaning for the consumer, may only be made where at least 20% of the energy value of the food is provided by protein.
"Good Source," "Contains" or "Provides"	10-19% of the DV per RACC. These terms may be used on meals or main dishes to indicate that the product contains a food that meets the definition but may not be used to describe the meal. 21 CFR 101.54(e)	A claim that a food is a source of protein, and any claim likely to have the same meaning for the consumer, may only be made where at least 12 % of the energy value of the food is provided by protein.
"More," "Fortified," "Enriched," "Added," "Extra" or "Plus"	10% or more of the DV per RACC than an appropriate reference food. May only be used for vitamins, minerals, protein, dietary fiber and potassium. 21 CFR 101.54(e)	Depends on whether the semantics used categorize the claim as "High" or "Source of"

SOURCE: SUKH GILL, LEATHERHEAD FOOD RESEARCH

■ In the EU, protein claims relate only to content, which is calculated using the formula: protein = total Kjeldahl nitrogen × 6.25. No explicit regulations address protein quality. In contrast, in the U.S., protein claims are related both to protein quality and content.

PDCAAS is based on the amino acid requirements of humans and their ability to digest them. Proteins can have scores from 0 to 1. It, too, has limitations. For example, the formula used to calculate PDCAAS can result in scores over 1.0 for some high-quality proteins, but 1.0 is the maximum score allowed—which limits its usefulness as a comparative tool. By combining foods with low PDCAAS values, a high PDCAAS can result.

"Should we then consider from a whole diet, rather than a single-food perspective?" asked Gill. "For nutrition labelling, a whole-diet approach makes sense; from a marketing perspective, claims are made on single foods." Also, PDCAAS doesn't address whether the true ileal digestibility of protein is preferable to the faecal measurement of protein.

For these and other reasons, the FAO has recommended replacing PDCAAS with the Digestible Indispensable Amino Acid Score (DIAAS). DIAAS equals 100 x [(mg of digestible dietary indispensable amino acid in 1g of the dietary protein) / (mg of the same dietary indispensable amino acid in 1g of the reference protein)].

However, DIASS also has issues. For example, more data on the true ileal amino acid digestibility of human foods is needed in the calculation of DIAAS. Until that becomes available, it is suggested that digestible individual dietary amino acid values should be calculated using faecal crude protein digestibility values applied to dietary amino acid contents.

If resources are not allocated to complete this research objective in a timely manner, current recommendations for the application of DIAAS may need to be reviewed.

Sukh Gill, Llb (Hons), DTS, MTSI, Director of Global Regulatory Services, Leatherhead Food Research, legislation@leatherheadfood.com, +44 (0)1372 376761, www.leatherheadfood.com/

Protein Consumption in Emerging Markets

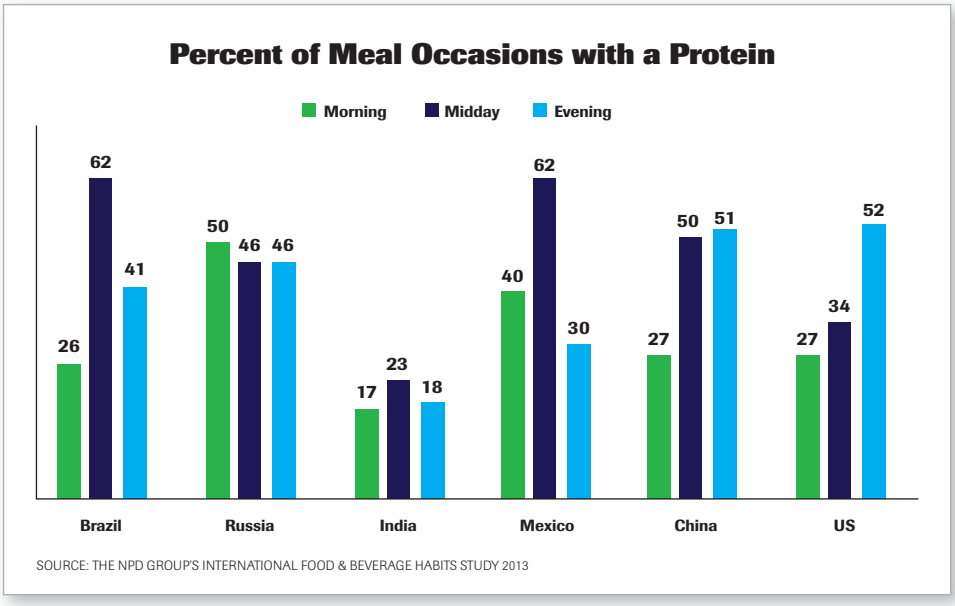
In March and April 2013, The NPD Group surveyed thousands of citizens in Mexico, Brazil, Russia, China and India about what they ate the day before. Their answers revealed telling information about what to expect from these markets in the years to come.

Looking at the numbers in Russia, for example, it's clear they eat proteins about 50% the time, regardless of the meal.

■ Although U.S. consumers say, "Breakfast is the most important meal of the day," protein is less likely to be included compared to lunch or dinner.

Other countries, the U.S. included, are more discerning of when they consume proteins. (See chart "Percent of Meal Occasions with a Protein.")

"Russians really like their proteins. That came out loud and clear in the study," said Darren Seifer, NPD's Executive Director, and Food and Beverage Industry Analyst.



By contrast, India is low on protein consumption, in general. They are most likely to consume proteins in their midday meal (23% of those surveyed), but that's only slightly more likely than morning and evening. Seifer suggested this is due to their large vegetarian population and cultural influences (such as religious beliefs), which could be tough to overcome if considering a push into this market with some products.

Interestingly, when asked what they consider the most important meal of the day, the U.S. and Mexico overwhelmingly said breakfast, but elsewhere the midday meal is considered of equal importance. These countries likewise have the most items or dishes in that midday meal, as opposed to the U.S. and China, which have the most in the evening.

These foreign markets also tend to be more connected to their ingredients. Citizens in Russia and Mexico make meals from scratch roughly 60% of the time, while those in Brazil notch 65%, China 70% and consumers in India a staggering 85%. "There's a lot more hands-on involvement in preparing their foods," Seifer said.

As for what proteins they're eating during these meals, Seifer broke it down as follows. Mexico, China and the U.S. favor eggs in the morning, while Brazil is likely to have cheese, as well as eggs. Brazil, Mexico and China are all likely to have meat in the afternoon, but Brazil and Mexico are just as likely to have poultry. China is likely to have meat and seafood in the evening, while Brazil and the U.S. often have meat and poultry. Russians are all about variety when it comes to their proteins.

For the snacking sector, consumers in the surveyed countries consume proteins about half as often between meals as they do during meals. The exception is Brazil, which rarely consumes protein between meals.

Darren Seifer, Executive Director and Food & Beverage Industry Analyst for The NPD Group, Inc., Darren.Seifer@npd.com, +1.866.444.1411, @NPDSeifer (Twitter), www.npdgroupblog.com

Proteins: Quantifying the Odds for Market Success?

The current trend analysis tools at our disposal include social media tracking, consumer surveys, retail-scanning data, new product introductions and SWOT analysis. All of these tools are useful, began Daniel Best, MSc, MBA, President and Founder of Best Vantage Inc., but they're only part of the picture.

"What we're missing is real-time, quantifiable change indicators—indicators that tell us we're entering a volatile situation," said Best.

According to Best, gathering real-time information is key in reducing volatility. Stock market analysts have known this for years, and they've developed practices to address it. Best says the volatility indication practices of the stock market, when applied to the Internet, can help provide insight on consumer food trends.

Obviously, the information is hard to qualify; there's a lot of "bad" information to sort through, and search engines are erratic, Best said. "Nonetheless, I think I can make a clear case for using some of these tools."

When put to use, Best's VIC TrendAlert™ Index (a proprietary tool used to quantify internet chatter) used top Google hits in April 2015 to reveal top dietary trends. Gluten-free topped 40 million hits compared to Vegan's 20 million, followed by Low-carb, Anti-inflammatory, Paleo, ABS (i.e., abdominal muscles diet), Vegetarian, Zone and High Protein (in at 11 million).

These top dietary trends comprise 160 million hits, or 84% of the total hits related to "diet." High Protein, specifically, topped such other major industry topics as whole-grain foods, sustainable foods, clean eating, Weight Watchers diet, South Beach diet and Monsanto GMO foods.

Six of these top 10 diets promote the increased consumption of protein, and three discourage animal protein

Diet Trend Growth Over Time

		Velocity (% growth over time)			
	2014 Google Hits	1 Year	3 Year	5 Year	10 Year
Vegan	12,100,000	591%	158%	89%	86%
Low-carb	7,820,000	812%	151%	117%	78%
Vegetarian	7,820,000	152%	80%	85%	68%
ABS	6,680,000	315%	112%	115%	79%
Gluten-free	4,180,000	128%	58%	85%	66%
Zone	3,270,000	91%	59%	59%	50%
Paleo	3,110,000	159%	98%	101%	74%
DASH	1,120,000	114%	85%	75%	56%
Anti-inflammatory	1,010,000	35%	80%	64%	49%

SOURCE: BEST VANTAGE INC.

consumption, Best noted. "So, if people are swinging toward these diets… we should expect to see an increase in consumption of protein among a significant segment of the population."

Seven of the top trends exhibited rapid, exponential growth in internet chatter, and many relate directly to protein. It's because of this fact that Best couldn't compile specific data regarding a protein-promoting diet to include in the attach chart. The interests overlap too much with other top diets ("like a Venn diagram of overlapping circles," he noted). That said, it's obviously a topic of increased interest, simply due to its association with these top searches.

Top Consumer Packaged Protein Goods: What's Growing, What's Not

	Sales (in millions)	% Change (vs. YAG)
Dog food	$3,591	-2.5
Nutritional (e.g., sports/energy bars, meal replacement)	$1,851	5.5
Cat food	$1,293	4.4
Yogurt	$1,242	-1.1
Frozen sandwiches (e.g., burgers, burritos, calzones)	$857	-3.9
Lunch combination	$781	11.2
Baby formula	$703	-17.0
Wholesome snacks (e.g., granola/fruit bars)	$630	25.1
Vitamins and supplements	$612	24.1

SOURCE: NIELSEN SCANTRACK 52 WEEKS ENDING 4/1/15 VERSUS PRIOR YEAR

Of even more interest is the fact that the top diets impact the types of proteins under discussion. "Consumer dietary preferences will have a significant influence on the quantity, type and form of protein consumed," he said.

As the chatter spikes and plummets, certain proteins attract attention. Based on Best's analysis, the most volatile and significant trends that impact protein are vegan, vegetarian, ABS and Paleo.

"If you don't have those diets on your radar, in terms of strategic planning, you should," he advised. "That being said, there's a lot that's also happening underneath the ice. Other trends are emerging, as well; they may not be as volatile, but they're showing significant increases."

"Proteins: Quantifying the Odds for Market Success." Daniel Best, MSc, MBA, Best Vantage Inc., 1-847-714-9527, info@bestvantageinc.com, www.bestvantageinc.com

Marketing Trends in Protein: Are You Capitalizing on the Opportunity?

"There are really two main things driving the whole protein movement," said Steve French, Managing Partner of Natural Marketing Institute (NMI). First and foremost, there's the increase in consumer perception that protein is beneficial for energy, weight management and strength—not to mention consumers' belief that they need more of it in their diets. In fact, 21% of Americans in 2014 considered themselves deficient in protein, compared to 11% in 2010.

The second thing driving the momentum is simple: "The plethora of new products available in the market."

New product launches have increased dramatically, French said. In the U.S. alone, there were more than 900 introductions between 2013-2014, according to the GNPD, compared to 278 between 2005-2006. The subsets and niches in which these products appear are the most interesting aspects.

"We can look across many different types of categories. You can look at snacks, beverages, whey protein, breakfast products, products targeted to kids and products targeted to mature groups: protein is everywhere," stated French.

Looking at the eclectic mix in the consumer packaged goods market data, French noted, "It's all about pets, kids and snacks." Pet-related protein products make up almost a third of the entire market, likely because dogs require twice as much protein as humans. French added, "Nutritional products, such as bars and drinks, also represent a significant opportunity."

The biggest growth in the industry is happening with vitamins/supplements and wholesome snacks, while baby formula has experienced the biggest decline. French attributed these numbers to a protein product "life cycle." Based on patterns that NMI has observed, French said bourgeoning sectors experience early success, but it then often turns to moderate growth, and ultimately flattens out or declines slightly. Yogurt and dog food fall at the end of this cycle; wholesome snacks are at the beginning; and other nutritional items in the middle.

"It's all about market timing," he said. "I'm not saying that yogurt isn't opportunistic, but if you had a choice on where to put your resources, it might be in wholesome snacks and nutritionals—because that's where the market has the most growth."

GM Contamination Action Thresholds	
Seed and other propagation materials	0.25%
Human food, ingredients, supplements, cosmetics and other products ingested or on the skin	0.9%
Animal feed and supplements	1.5%
Packaging, cleaning products, textiles and other products not ingested or used on the skin	1.5%

SOURCE: NSF

"Marketing Trends in Protein: Are You Capitalizing on the Opportunity?" Steve French, Managing Partner, NMI, Steve.French@NMIsolutions.com, 215.513.7300, x214, www.NMIsolutions.com, www.twitter.com/NMItweets

What to Expect When You're Expected to Achieve Non-GMO Project Verification

There are many things you need to know if you're going to pursue non-GMO Project verification, including definitions, retail and consumer perception, the legislation surrounding them and the background of the Non-GMO Project organization, said Nancy Knight, Business Unit Manager for NSF International, which is a Technical Administrator to the Non-GMO Project.

However, if there's one key element one really must know, it is the food components.

"Coming out of the food industry, and being on the technical side, I was used to the requirements of tracing your ingredients for food certifications, but the depth of knowledge required for Non-GMO Project verification was a real eye-opener on things you'd probably never thought about asking your suppliers," said Knight. "Because traceability is key for determining non-GMO status, ingredients throughout the supply chain have to be verified." As Knight noted, the system "may seem complicated," but as the fastest growing label in the industry, many companies are committed to pursuing this verification. A few points are offered here.

The three core components of the Non-GMO Project Standard are:

- **Testing.** All major GMO risk ingredients must be tested prior to use in a verified product and be compliant with the action threshold.
- **Segregation.** Segregation requirements ensure that, once tested, material is protected from contamination throughout the manufacturing process.
- **Traceability.** Traceability measures ensure all high-risk inputs are tracked through to the final product.

The first step in obtaining verification is to separate your ingredients into non-risk, low-risk and high-risk. Each category undergoes different levels of testing. Non-risk ingredients are "not derived from biological organisms and are not, therefore, susceptible to genetic modification." Examples include salt, lime and fossil-based products.

Items falling into the low-risk category are "species for which genetically modified versions have not yet been commercialized or for which there are no known or suspected instances of contamination." Examples would be bell peppers or quinoa at this point in time. High-risk foods or ingredients include those that are commonly genetically modified, such as corn, soy, cotton, canola, papaya, sugar beet, summer squash, alfalfa, animal derivatives (honey, dairy, meat) and microorganisms/enzymes.

If it is a single, unprocessed ingredient under consideration, it's relatively easy to decipher if it's high or low risk. However, if it is a further-processed ingredient, determination of non-GMO status becomes more difficult. Examples of the latter include modified starch, dextrose and vegetable oil.

"Ask your supplier to disclose the source of the ingredient when there is a chance of it having come from a high-risk source," Knight advised.

After risk assessment, the next step is to classify ingredients as major (>5%), minor (between 0.5-5%) or micro (<0.5%) components of a product. "Defining ingredients" that appear as part of a product's name are considered major and will be tested. All high-risk inputs that are major ingredients in the final product are tested using either genetic (Real Time or Digital PCR) or immunologically based tests.

For example, in the case of a corn chip where the finished product contains 97% corn and 3% oil, the certifiers will ask to see a sampling and testing plan for the corn. In the case of a meat-based product that is 99% beef and 1% spices, they need to see a sampling and testing plan for the feed the cows consumed.

"While the absence of all GMOs is the target for all Non-GMO Project standard compliant products, the Non-GMO Project knows that is not realistic and, therefore, it is not the requirement," Knight said. She provided a chart that detailed permitted level of GM contamination in various products. (See chart "GM Contamination Action Thresholds.")

"The Non-GMO Project asks that participants implement continuous improvement practices in their quality management

Comparing Algae to Other Protein Crops

Plant	Average Biomass Yields (MT/ha/yr)	Oil Content (% dry mass)	Sugar/Starch Content (% dry mass)	Energy Content of Oil/Sugar/Starch (boe/1000ha/day)	Protein Content (% dry mass)
Soy	1-2.5	20%	18%	3-8	37%
Rapeseed	3	40%	n/a	22	23%
Palm	19	20%	n/a	63	15%
Jatropha	7.5-10	30-50%	n/a	40-100	24-28%
Corn	10-12	4%	75%	240-300	4-14%
Sugarcane	60-70	n/a	12-16%	230-370	3-4%
Microalgae	40-100+	25-50%+	15-25%	330-785+	25-60%+

SOURCE: NSF / MATT CARR, ABO

systems," Knight said. A key requirement of such quality management systems is to meet and always be below an action threshold. Inputs that do not comply with the testing requirements may not be intentionally used in verified products.

Nancy Knight, Business Unit Manager, NSF International, nongmo@nsf.org, 858-200-9722, www.nsf.org

Current and Future Developments in Algae Protein Commercialization

Algae have picked up a great deal of commercial momentum in recent years. There are over 50,000 species—from microscopic organisms to large seaweed—and all are exceptionally fast growing and productive. Crops of some mature in hours or days, instead of months or years. They have some of the lowest carbon, water and arable land footprints of any crop, according to Matt Carr, Ph.D., Executive Director of Algae Biomass Organization, and the Pre-Conference's "Special Focus" presenter.

The U.S. Department of Energy is leading the "algae charge" in the U.S. In 2009, it invested $100 million in algae biorefinery projects. Every year since, it has spent $25-30 million on research and development of algae-based biofuels.

"Along the way, a surprising thing happened," Carr said. "Companies discovered what many societies have known for a long time. Not only are algae productive, they have things other than oil that could be of interest to consumer markets—in particular, protein content."

The recent demand for protein is "stressing our land [and] thinning our seas, and Mother Nature isn't cooperating," Carr said, referring to global climate change. "It's time to get back to basics: specifically, the use of one of the earliest life forms as a source of protein."

On average, algae generally matches or exceeds other feedstock protein crops in desired components, except sugar/starch content, where corn is still "king." That said, algae is relatively new to the protein realm and is mostly found in powdered forms for nutritional supplements.

The "grand daddy" of algae protein strains is spirulina, a 60%+ complete protein with powerful antioxidants like astaxanthin. It has a more than 30-year history in the nutritional supplement market and has more recently moved into the beverage market, with products like Naked Juice.

In the 40s and 50s, the green algae chlorella was considered a solution to the global food crises. It now is a nutritional supplement and protein flour that Carr says has a lot of potential in fermentation-derived products.

Researchers continue to experiment with what Carr calls "the next generation of agriculture," by using algae for natural pigments/coloring and feed for salmon, carp, shrimp, broiler chicks and weanling pigs.

"Consumer demand is driving the new wave of innovation in algae protein," Carr said. "There are exciting new products entering the market, including algal flour and natural pigments, and this multi-product model that's emerging will likely enable further growth."

Matt Carr, Ph.D., Executive Director, Algae Biomass Organization, +1.877.531.5512, mcarr@algaebiomass.org, www.algaebiomass.org/

Global Food Forums, Inc. wishes to thank the speakers, attendees, sponsors and tabletop exhibitors for making the 2015 Protein Trends & Technologies Seminar a very successful event. Complimentary copies of the presentations may be downloaded from http://globalfoodforums.com/2015-protein-seminar/store.

If interested in receiving future notifications of when complimentary conference special reports and presentations become available, please sign up at http://ow.ly/OsEtm.

Resources on Protein Ingredient Technologies

Traffic to Global Food Forums' website (www.GlobalFoodForums.com) has steadily increased since its inception. With some 133,000 views by December 2015, the site is a treasure trove of free access to past presentations by high-profile industry experts, as well as trends and statistics related to Global Food Forums' core conference topics. Here are some items you may have missed. Again, be sure to check out the free downloadable PDFs from presentations given at the 2015 Protein Trends & Technologies Seminar at www.GlobalFoodForums.com/2015-protein-seminar/Store.

Sharp Increase in Diverse Protein Types

A recent survey, taken during Global Food Forums, Inc.'s 2015 Protein Trends & Technologies Seminar, shows protein-knowledgeable food formulators and food scientists anticipate strong growth in the use of a wide variety of protein types. Those surveyed were selected based on their direct involvement in R&D and product formulation.

Pea protein is at the top of the list of protein types with 88% of respondents predicting will have increased use in the next two years. Some 74% indicated an increase for use in pulses (not pea), followed by algae and hemp, each with 72%, then quinoa and chia (66%). Insects as a protein type nabbed 61% of respondents.

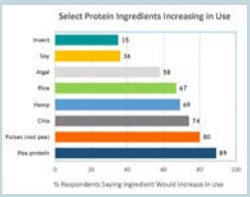
Some newer (and only recently commercially available) proteins, such as duckweed (*Lemna minor, Wollfia*), underscore the fact that food formulators are searching out new approaches to provide desired protein content in their products.

This survey will be again be conducted at the 2016 Protein Trends & Technologies Seminar, May 3rd and 4th, in the Chicago area. www.globalfoodforums.com/2016-protein-seminar.

Beyond the Yuck Factor, Insect Proteins Face Hurdles

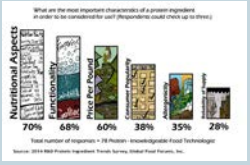
There has been an abundance of attention-grabbing headlines that promote the use of insects, particularly insect protein, for human food use. A key advantage is their ability to provide high-quality nutrients with relatively low agricultural input; they are a sustainable food source. However, despite media coverage on the topic, the reality within the food industry itself is a somewhat different story. As with all food ingredients, before proteins from insects are formulated into foods, they must meet a number of conditions. To garner insights from a key group whose primary task is to choose ingredients to formulate into products, Global Food Forums, Inc. conducted an "R&D Protein Trends Survey" among R&D food technologists attending its third annual Protein Trends & Technologies Seminar in May 2015. The "protein knowledgeable" food technologists completed a survey to assess cricket protein on eight factors that could be barriers to its use in foods, on a scale ranging from 1 (insignificant barrier) to 10 (maximum barrier). Those who tasted the cricket protein flour during a Protein Products Sampling Session gave the ingredient a total barrier score of 6.34; those that had not tried the powder responded with an even higher barrier score of 7.74. To see the complete July 22, 2015, Press Release and results, go to http://ow.ly/QCOzV or scan the QR code to the right.

Formulators Identify On-trend Protein Ingredients – 2014 Survey



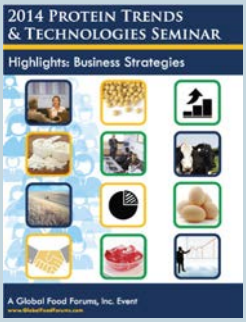
The significant number of food technologists attending the "Formulating with Proteins" program at each year's Protein Trends & Technologies Seminar provides Global Food Forums an excellent way to gain opinions and insights from those who formulate with protein ingredients on a large, commercial scale. The "2014 R&D Protein Trends Survey," conducted at that year's seminar, provided such insights. In its survey, Global Food Forums, Inc. asked: "Do you see the use of the following protein types (as a powdered ingredient within formulated products) as decreasing, increasing or remaining the same in the USA in the next two years?" Those surveyed were then given a list of 17 ingredients. Pea protein was identified by 89% of the 78 "protein knowledgeable" food technologist respondents as increasing in use in the next two years. "Pulses (not pea)," "chia," "hemp," "rice" and "algal" proteins followed with 80, 74, 69, 67 and 58% of respondents, respectively, saying they would increase in use. To see the complete Press Release (just released May 14, 2015), go to http://ow.ly/QD2MS or scan the QR Code to the right.

Formulators Identify Most Important Characteristics – 2014 Survey Results



From algae to whey, protein ingredients are obtained from a wide variety of sources and differ from each other in key characteristics. During the design of a new food, beverage or nutritional product, product formulators choose which proteins they will use based on these characteristics. During Global Food Forums' 2014 Protein Trends & Technologies Seminar, attendees whose responsibilities included product formulation were asked: "What are

the most important characteristics of a protein ingredient in order to be considered for use?" They were instructed to choose three of eight options provided. Some 70% of the "protein knowledgeable" food technologists identified a protein's "nutritional aspects" as one of the top-three most important characteristics to consider. This was followed closely by "functionality (physiochemical properties)," identified by 68% of the technical respondents. To see the complete Press Release (just released March 12, 2015), go to http://ow.ly/QIQoa or scan the QR code to the right.



2014 PTT Pre-conference Program Highlights Available

Attendees to the 2014 Protein Trends & Technologies Seminar's "Pre-conference: Business Strategies" were presented updates on factors impacting the global protein ingredient marketplace. The program consisted of speakers from companies such as Euromonitor International, Frost & Sullivan, Decernis, Best Vantage, Inc. and The NPD Group. Highlights from the program, including charts and statistics, can be accessed by going to http://ow.ly/RdfIQ.

Currently Under Development: Global Food Forums' Spanish Microsite

Global Food Forums is developing a microsite in Spanish. This site will contain industry news and formulation technologies related to the conferences of Global Food Forums. We invite you to visit the following webpages.

Global Food Forums está desarrollando un micrositio en español. Este sitio contendrá noticias de la industria y tecnologías formulación relacionadas con las conferencias de Global Food Forums. Le invitamos a que visite las siguientes páginas.

Scan the QR code to the left to see the home page of Global Food Forums, Inc.'s microsite in Spanish. It will have links to information about Global Food Forums and who we are, conferences, trends and data, complimentary information and links to philanthropic organizations.

Esta es la página inicio del micrositio en español de Global Food Forums, Inc. Contará con enlaces a información sobre Global Food Forums y quienes somos, conferencias, tendencias y datos, información gratuita y enlaces a organizaciones filantrópicas. www.globalfoodforums.com/es/inicio/

Química de Proteínas y Necesidades de Formulación

Las proteínas se añaden a los alimentos por razones nutricionales y por su funcionalidad. Las características funcionales incluyen la mejora de la viscosidad y la retención de agua; la gelificación; aireación y formación de espuma; y la emulsión a la vez que mejora el sabor, la textura y el color de un alimento. Las proteínas difieren en sus características funcionales y, por lo tanto, su adecuación para una formulación específica es un reto. Por ejemplo, las proteínas de suero de leche tienden a tener capacidades medias emulsionantes y de formación de película medias; una amplia gama de capacidades de gelificacióny de batido; y son estables al calor, pero en menor medida al medio ácido. http://ow.ly/QJ2LT

Las 10 Principales Tendencias para el 2015 con información sobre Proteínas

La tendencia hacia las proteínas sigue fuerte. Los consumidores consideran que las proteínas son saludables y los fabricantes responden a esa visión enriqueciendo sus productos con ellas. Los proveedores de ingredientes, los fabricantes de alimentos y los consumidores están en busca de la próxima fuente de proteínas. La proteína de soja es la más utilizada en los nuevos productos lanzados al mercado. La proteína de arveja crece con rapidez pero desde una base reducida. La proteína de lactosuero es popular desde hace varios años y continúa creciendo. Se anticipan más aplicaciones con proteína de alga en el futuro. http://ow.ly/QJa1M

Jenny Bogdajewicz Stricker, Conference Coordinator

Barbara T. Nessinger, Content Manager

Trevor Kupfer, Contributing Editor

Peter Havens and Claudia O'Donnell, Co-owners

Peter O'Donnell, Cover Design

Global Food Forums, Inc.

www.GlobalFoodForums.com

P.O. Box 1421

Saint Charles, Ill., USA, 60174

+1.800.799.9671