

Shifts in transitional protein solutions

Millennials are the drivers of change in many areas of food production - Part I

For centuries, meat and meat products have been the center of the plate to supply protein and nourishment. Ever since the turn of the Century, a seismic shift occurred and especially meat-formulated snacks, cheese, egg and yoghurt are now considered the preferred emerging animal protein choices. In 2015 this trend is picking up further speed as increasing number of consumers replace meat with non-meat alternatives, including the great many extruded structured plant protein and hybrid foods in which meat is either eliminated or used as a component rather than a dominant source.



In contrast to Baby Boomers, the Millennial generation prefers less processed food.

By Henk Hoogenkamp

The consumer landscape is changing rather quickly and especially the Millennial consumer (born 1984-2004) are driving change in areas such as clean labels, natural, and recognisable ingredients. This powerful group of consumers is looking for unique meals or meat snacks with less or no preparation time. However, they also want the

foods to fit a holistic wellness that are perceived as foundationally nutritious. Differentiating lifestyle foods for the specific consumer segments is transitioning to the new normal.

Consumer eating habits in the US are changing and there are clear indicators that explain why these patterns are evolving. The most obvious sign of change is

the fact that Millennials will surpass baby boomers (born 1946-1964) as the largest generation in 2015. The Millennial customer prefers less processed food including menu components that are made to order, be personalised or customised.

Consumption of fresh foods, including vegetables, fruits and snack meat grew by 20% from 2003 to 2014. Looking at it from a different perspective, more than half of food and beverage consumption now happens when consumers are alone, not to mention the fact that households of just one person – 27% in 2015 – are at the highest level in US history. The trend of eating solo will grow in the years ahead and ultimately will also start to impact EU consumption patterns.

Meat rules protein

Consumers' relationship with meat in their diets is changing. This is mainly caused by the shift in perceptions of meat's effect on nutritional and health properties. Although it is true that affluent consumers are increasingly aware of the importance of dietary protein, they often look away from meat and instead prefer non-meat foods as their first

choice. This development should set off alarm bells for the meat industry in the western world.

Growing meat consumption in emerging markets will push the global market with a volume growth of 3% in 2015. Poultry has emerged as the most-popular meat protein in the world, increasing by 4% volume growth.

Shifts in meat consumption occur in both developed and developing markets. The US and some EU countries have a negative growth (-1%), while poultry wins shares of the consumer stomachs at the expense of beef and pork with the exception of China. Some of the decline in meat consumption is due to health concerns, religious and sustainability issues, but also due to consumers embracing or adopting to a different diet and lifestyle.

The twin effects of time-pressed lifestyles and pressed budgets are the main reason that consumers living in affluent societies are shifting away from home-cooked traditional center-of-the-plate whole muscle meat cuts and switch to semi- or fully prepared natural wholesome options including snacks. Increasingly meat is looked at as an ingredient.

Good reasons for the iPad-App of FleischWirtschaft International



Back to natural

There is no question that today “fresh and natural” beats low-calorie and processed packaged foods. “Packaged fresh” is the new mantra for Americans and the social media savvy millennial generation in particular. The change from over-processed using “chemically-loaded” additives seems unstoppable and signals that a new age of whole and unadulterated food has arrived. The modern affluent consumer now wants simplicity that often translates to purity and less. Modern consumers are now too informed to fall for the gimmicks of the large food companies that dress up their products as “natural” but little else to substantiate the claim. As a matter of fact, the US Food and Drug Agency does not even regulate these claims.

The top 20 US food and beverage companies have started to lose business ever since 2008. These legacy companies are on a slow decline and – in fact – have become less relevant. There is a clear discrepancy between the image they want to portray and the suspicion in the mind of consumers. Increasingly the word “processed” translates to “unhealthy” and that is basically the cornerstone issue of the distrust in the current food system.

The big food companies have been put on notice and are changing their vocabulary accordingly. New language is now inserted to attract the interest of consumers: organic, natural, high-protein, extra veggie, and glutenfree. Out are words such as low-fat, light, or reduced. Not only consumer language, also industry-speak has changed. Now, food is no longer “processed” but rather “preserved” and “formulas” has changed to “recipes”. These seem subtle changes but the wholesome vocabulary is picking up great momentum.

The extraordinary paradigm shift is needed to align with the new consumer expectations of a clean and clear ingredient label. It is too early to tell if the multibillion-dollar remake and transformation of the food and meat industry will be successful. There is an obvious distrust in the mind of the consumer who is turning

away from the colossal legacy food companies. Instead, an increasing number of consumers is seeking out authentic natural and pure food and meat products across nearly every category.

Over the past few years the volume of packaged food in the US has fallen and there is little doubt that mainstream supermarkets suffer from a decline of sales of conventional processed foods. But then again, why wonder? These mammoth food and meat companies misused for too long chemically sounding and unhealthy additives. Consumers have wised up and increasingly reject the notion that they are eating foods made with growth hormones, antibiotics, pesticides, gluten, genetically modified organisms (GMO's), preservatives, high fructose corn syrup, artificial flavours, colours, and emulsifiers such as polyglycerol and polyricinoleate.

The rebellion of American consumers has taken the big food companies by surprise so it seems. These companies are now figuring out whether the change is a fad or a long-lasting trend. But facts cannot be ignored in declining sales volumes in categories such as sugar-loaded breakfast cereals, canned soups, canned vegetables, lean cuisine, and frozen foods. The decline of frozen ready-to-eat meals is no surprise really. After all, “frozen” is the opposite of “fresh”.

The large food and meat companies are faced with a huge controversy dilemma. There is the polarizing issue of GMP-labelling on one end and the growth of the new wave organic and natural foods on the other side. These issues are further clouded that increasing number of entrepreneurial food companies do not need to beg supermarkets for shelf space anymore. Internet sales, including Amazon, are now among the top 10 vendors in the US, a number that is rapidly growing with no end in sight.

No wonder that legacy food companies are out in full force to acquire (small) natural health food companies, while also radically rethinking their own food concepts and strategies of how to charm and regain the trust of their customers. It is likely that going



The large food and meat companies are faced with huge changings in consumer's preferences.

forward it is clear that an actionable and transparent pathway will be needed how much additional value can be created. The philosophy should be proactive strategies, not only to reinvigorate existing portfolio brands but also to benefit from further “natural food” and “wellness” extension acquisitions in the consumer-branded space. The ultimate goal is to contemporise and add relevance to the food brand that will have a clean label positioning. The willingness of people to adopt new food trends is happening at a pace that is unprecedented. As the economy improves, consumers with more discretionary income will put food quality and image ahead of price.

Food bubble

In a world with rapidly increasing populations and a growing number of people moving up the food chain consuming grain-intensive animal proteins such as meat and dairy, chances are for real that a major disruption in food supplies is looming. Even now, some areas of the world can be seen as a “food bubble” which is the result of using unsustainable agricultural methods like over-pumping of groundwater in order to keep farming yields to unrealistic inflated high levels. Moreover, the rapidly changing consumption patterns, the growing populations, and depletion of natural resources pose real challenges for future generations.

The need to feed a growing number of people globally has resulted to widespread environmental degradation, and loss of biodiversity, affecting about 25%

of global soil. Shifts to more protein-rich diets in developing countries and a growing demand for land harvested biofuels and biomaterials – especially in developed countries – will ultimately exceed sustainable supply capacities.

With the planet's population growing by some 80 mill. people a year and the quality of life in developing countries improving, the demand for food will definitely expand. It is safe to predict that meeting the needs of some 9.4 bn. people expected to be living on planet Earth in 2050 will require some heroic efforts.

The world population by 2050 will call for approximately 70% more in food to meet global demand. Demand will probably outstrip crop harvest, especially when resource limitations will continue to constrain global food systems. As such, it can be expected that food issues could become politically destabilising, very much the same way energy is today.

The quadrupling of the world's population since 1900 has caused a fundamental change in soil and crop harvest management to meet the rapid growing food demand globally. The future of food security need to be based on the professionalism of agriculture through research and applications, education, output efficiencies, and the redirecting of feed to food. Especially for developing countries, including India and China, the low levels of fertilizer nutrients uptake results in soil and water acidification, contamination of surface and groundwater, and rising greenhouse gas emissions.

The current agricultural increase in productivity of slightly more than 1% per year needs changing and intense farming based on new technologies to be implemented. Agricultural productivity is closely interconnected with food safety, genetically-modified organisms, health, nutrition, sustainability, environment and obesity. Diet, climate change and agriculture are intertwined and it is difficult to tackle one without consideration of the others.

How can the world reach a sustainable protein supply that meets growing nutrition and health expectations? Demand for premium protein is experiencing exceptional global growth and it can be expected that availability will fall short. As income levels in developing countries rise together with subtle changes to a Western diet, per capita protein consumption is expected to grow by 15 to 20%. In addition, nutritional awareness in affluent countries by specific segments such as sarcopenia and lifestyle nutrition will put further pressure on premium protein availability. Protein sustainability is not an easy issue, but most probably the answer is to optimise diet and health by promoting increased consumption of premium plant protein sources and a reduction of animal protein. To answer the rapidly changing market dynamics, it is likely that a blend of both plant and animal protein will optimise health as well as utilisation of available agricultural resources.

The synbio reality

It is clear that the world cannot rely solely on increases in arable land. Instead new technologies – including considering GMO – need to be implemented to meet the food demands of the future. In the last few decades major strides have been made to increase both animal and plant protein production. However, more innovation needs to move through in order to significantly increase the current food production by 2050.

One of these emerging technologies is synthetic biology. Synthetic biology will be the next frontier of food science and technology. Synthetic biology, also



Photo: Food Studio Inge Iffe

A blend of both plant and animal protein will help to use the available agricultural resources in a sustainable way.

known as “synbio” involves a technology in which genes from a plant are treated in a yeast environment creating new compounds by fermentation. Ultimately, synbio will evolve to a cost-effective and eco-sustainable technology and this next stage of genetic engineering can produce more efficiently than nature, using no land, and is not dependent on weather conditions.

Computer algorithms are now often used to analyse plant species and once identified, recombined to create design-specific protein properties including nutritive value, taste, flavour and functional performance. Stripping out and recombining a food’s constituent parts will further push the boundaries of food science as it is known today.

In principle, synbio ingredients are chemically identical to its natural example. The future of synbio ingredients and food is only limited by our imagination. Both plant and animal protein can potentially be manufactured by synthetic biology. For example, cows can be by-passed using fermentation to engineer animal-free milk. Animal-based dairy farming could very well develop into a historical curiosity. Animal-free milk using basically the same principles of biotechnology fermenting sugar into alcohol and further refinement by modulating yeast and enzymes, can create design-milk in which its components, including protein, fatty acids, flavour, viscosity, can be varied to obtain desired orga-

noleptic and nutritive characteristics. For a growing number of future driven scientists, livestock is an antiquated technology.

Although synbio companies like to portray the “all-natural” status of this innovative technology, ultimately it will be the consumers who will decide whether or not they are ready to accept these modulated foods. In the meantime – like the “traditional” GMO’s – the regulatory agencies are confronted with the formidable task to agree on adequate assessment and rulemaking about health and environmental safety as well as labeling.

Greenhouse gas emissions

Long-term agricultural greenhouse gas emissions are clouded by two main uncertainties:

- How does livestock production and consumer preference for meat and dairy cope with much needed yield improvement in order to meet rapid growing demand?
- How fast do human dietary requirements and food preferences change?

Emissions are closely interrelated to agricultural land, manure management, crop yield, genetic livestock improvement, and possible climate change and water availability. When extrapolating 2015 baseline knowledge to 2050 feed and food availability, it can be concluded that increased ruminant meat and dairy consumption will not be able to keep emission levels within agreed targets, unless unprecedented technology improvements occur and implemented. Hence, based on today’s state of technology, it can be predicted that meeting climate targets may require reducing meat and dairy consumption. To be specific, in reality this will mean an increase per capita consumption in the developing world and a much needed decrease in affluent societies. To be realistic however, this is not going to happen anytime soon.

Carbon dioxide emissions from energy and transportation currently take the largest share of climate pollution. On the heels of energy and transportation come the emissions from agriculture and these will continue to in-

crease to keep pace with the projected significant growth of global meat and dairy consumption. It will be necessary to address these increases because when no adequate actions are implemented, nitrous oxide from field and methane from livestock may double by 2070, if not sooner.

Diets high in dairy and meat are expected to rise exponentially because of growing number of world citizens that will have the means to afford these much beloved foods as the primary source of nutrition. However, the enormous expected increase in animal protein consumption will mean a real setback to reduce greenhouse gas emissions.

The solution will be to develop improved genetics of livestock providing increased amounts of lean muscle meat, cultured meat, insect protein extraction and last but not least great tasting nutritive plant-based protein foods. Consumers should be encouraged to eat more plant-based protein foods to improve not only nutritional status, but also relieve rising world demand for meat and dairy protein. Most – if not all – of the West European countries are not self-sufficient in foods supply and heavily rely on vast imports from other parts of the world. Putting more emphasis on plant protein formulated diets is a major step forward for a country to secure its food supply. The bottomline is that consumers should be encouraged to have diets that are less energy-dense, allowing a larger food-intake containing more essential nutrients such as proteins, healthy oils, vitamins and minerals.



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