Jungbunzlauer

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facts

Optimising texture in plant-based foods

Introduction

The demand for plant-based food is gaining momentum worldwide, with a profusion of new products being launched and many consumers moving towards a more plant-based diet. In this kind of food, ingredients of animal origin are replaced by plant-based alternatives. There are various reasons why consumers might look for alternatives to meat and dairy products, or even more niche applications like plant-based egg alternatives in some cases. The top three reasons consumers give for considering plant-based food are that it “is healthier”, “is better for the planet”, and “brings variety to my diet”, according to Innova Trends Survey 2022 and 2023.[1]

As the plant-based food industry continues to grow and diversify, so does the need for innovation in suitable, high-quality ingredients. There is also an increased demand for advanced process technology. However, there is an important first question manufacturers need to address: should the plant-based product imitate an animal-based product, or should it differ in terms of texture or taste? Since flexitarians make up a substantial proportion of consumers that are interested in plant-based food, plant-based alternatives are required to simulate the look, feel and taste of an animal-based product in many cases.

When asked why they would not consider plant-based alternatives, 34% of consumers surveyed in the Innova Trends Survey 2023 responded with “taste and texture”, underlining the need for the industry to investigate this topic and understand exactly how textural structures work. While the structure of meat and muscle is clearly difficult to replicate, many other structures are also integral to animal-derived ingredients and therefore merit investigation. Equally challenging is the simulation of dairy products and the behaviour of casein in terms of foaming, homogeneity and temperature stability. Apart from lacking in texture and taste, plant-based products sometimes miss the nutritional profile of their traditional counterparts, making fortification with certain additives essential.

Each of these topics is highly relevant for the future development of the industry, and each comes with its own difficulties and challenges. In this paper, we will focus on different kinds of texture and how they can be achieved with the help of Jungbunzlauer ingredients. Two Jungbunzlauer hydrocolloids, in particular, will be studied: xanthan gum and gellan gum (TayaGel®).

In the European Union, both of these gums are listed as generally permitted food additives (E 415 xanthan gum, E 418 gellan gum) and may be used in accordance with Regulation (EC) 1333/2008. In the US, the FDA has affirmed xanthan gum and gellan gum as food additives permitted for direct addition to food for human consumption (21 CFR 172.695 and 21 CFR 172.665, respectively). They are specified to meet the requirements of the latest edition of the Food Chemicals Codex (FCC) and of Commission Regulation (EU) 231/2012.

This study will examine the foam stability of plant-based barista cream and the stabilisation of oat-based cooking cream. Furthermore, we will explore options for improving the texture of plant-based cold cuts and scrambled eggs. Last but not least, we will take a closer look at the spherification of popping and culinary pearls. Each of these applications and products presents its own challenges due to the unique texture of the traditional animal-derived counterpart products, the imitation of which is the ultimate goal. Only if these challenges are confronted will manufacturers of plant-based foods be able to offer the best possible texture and taste experience to the consumer.

For all of the texture-related experiments, we utilised a texture analyser – a measurement system that moves either up or down to compress, penetrate or stretch a sample. The travelling arm of this system is fitted with a load cell and records the force response of the sample to the imposed deformation. Force, distance and time data are collected and usually presented as a curve on a graph which, when analysed, indicates the texture of the sample. More detailed information can be found on the manufacturer’s website and on request.[2]

Recipe cards are available on request for all presented projects.

Barista blend

Oat milk is the most popular and established base for milk alternatives: according to Innova Market Insights, it is the fastest growing product base in this category, with a compound annual growth rate of 33% between 2018 and 2022. Oat milk has a 21% share of dairy alternatives, which is the highest share.[3] The main driver for this growth is the rise in the vegan population.[4]

The goal of this project was to create an oat-based barista beverage specifically designed for use in coffee drinks. The base components are oats, water, canola oil, sugar and salt.

Results

One of the challenges in creating an oat-based barista beverage is ensuring its stability in an acidic environment such as espresso. The pH of espresso can vary depending on the type of coffee beans, brewing method, and even the water quality. A typical pH range for espresso is between 4.7 and 5.3. When exposed to low pH, the proteins in oat beverages can denature, which can negatively affect their solubility and stability. To prevent this, the beverage needs to be buffered to a more basic pH of 7.5. The initial pH of our oat beverage base was 7.3. Without a buffer, the base was not stable when added to espresso. This was evident by the immediate precipitation caused by protein denaturation. The most common buffer used in these types of beverages is dipotassium phosphate, which helps prevent changes in pH when the drink is combined with coffee. With the addition of 0.12% dipotassium phosphate, the pH of the beverage rose to 7.58, helping achieve stability of the barista blend in espresso.

Another big challenge in creating an oat-based barista beverage is ensuring the quality of the foam, including its stability and appearance. To improve the foam quality, we added TayaGel® HA, a high acyl gellan gum from Jungbunzlauer. This hydrocolloid helped stabilise the foam and improved its appearance, as well as helped maintain the foam suspended throughout the liquid phase.

No stabiliser (after 15 minutes) TayaGel® HA 0.025% (after 15 minutes)

Figure 1: Foam appearance without (left) and with (right) TayaGel® HA as a stabiliser, 15 minutes after heating and frothing

In order to create a standardised foam, an electric steamer was used to heat the blend to 70°C while frothing for 90 seconds. A base without a stabiliser was compared to a recipe with 0.025% TayaGel® HA. A Brookfield DV3T rheometer was used to measure the viscosity of the samples. The viscosity of the version with TayaGel® HA increased only slightly, from 21.6 cP to 38 cP. There was no notable difference in foam height or volume between the two versions, while the difference in foam quality was very evident. The foam of the base without TayaGel® HA had larger, dull, bubble-bath-like bubbles. The foam of the version with the hydrocolloid had small, dense bubbles with a slight shine that were uniform and stable over time as shown (figure 1).

There was also another beneficial effect of TayaGel® HA on foam quality. This was not readily apparent from the foam volume and height data. When pouring, visual observation revealed the ability of TayaGel® HA to prevent the separation of foam from liquid. For comparison, a version without stabiliser was left undisturbed for 15 minutes. When poured, the majority of the foam remained in the beaker. In contrast, adding 0.025% TayaGel® HA resulted in a uniform distribution of the foam throughout the liquid during pouring, with almost no foam left in the beaker.

With the addition of TayaGel® HA, the final recipe contained 96% oats and water, 2% canola oil, 2% sugar, 0.025% TayaGel® HA, 0.12% dipotassium phosphate and 0.03% salt.

The last aim of this project was to create a sugar-reduced version of the recipe. The original full sugar recipe base contained 2% sucrose as the only added sugar. The modified recipe does not qualify as sugar-free because it contains about 1% naturally occurring sugars. To create the sugar-reduced version, Jungbunzlauer ERYLITE® erythritol was used, a clean-tasting, zero-calorie sweetener which is well tolerated by the digestive system. Erythritol has only 0.6 times the sweetening power of sugar, and accordingly, the recipe required 3.4% ERYLITE® to achieve the same sweetening level as with sugar. This is just below the FDA's maximum allowance of 3.5% for beverages. The recipe is not suitable for the EU market, as applicable regulations do not permit polyols in dairy alternative products for sweetening purposes.

Conclusion

This study investigated ways to improve the foam quality and reduce the sugar content of an oat barista blend. It was found that the addition of TayaGel® HA to the oat base helped make the foam more stable and uniform. Additionally, it was possible to create a "no added sugar" version without sacrificing taste using ERYLITE® erythritol. Both TayaGel® HA as stabiliser and ERYLITE® erythritol as a natural sweetener are valuable aids to creating high-quality, pleasant-tasting oat-based barista drinks.

Cooking cream

Fairly new plant-based products on the horizon include plant-based cream alternatives for cooking or whipping. Achieving the right texture and mouthfeel for these cream alternatives, as well as stability during production and storage, can be challenging. The goal of this project was to explore how Jungbunzlauer biogums can help overcome these challenges and develop an oat-based cream for cooking applications. Storage stability and a pleasant, creamy mouthfeel were the targets that were set for the project. Rheological measurements were carried out to evaluate the influence of hydrocolloids on viscosity and their effect on stability. The cream's performance during cooking in a tomato soup was also evaluated.

Results

The base recipe for this study contained 87% oat and water mixture, 12% canola oil, 0.3% sunflower lecithin, 0.1% salt, 0.3% xanthan gum and 0.03% TayaGel® HA.

Visual stability tests showed that xanthan gum alone is not able to stabilise the oat cream properly while still keeping a pourable product. The phases visibly separated, most likely due to the interaction of xanthan gum and proteins. In contrast, a combination of xanthan gum with TayaGel® HA yielded a shelf-stable product without signs of phase separation for at least 3 months at 7°C. Here, xanthan gum acts as a thickener, adding viscosity and improving mouthfeel, while TayaGel® HA stabilises the product. The use of 0.3% xanthan gum together with 0.03% TayaGel® HA resulted in excellent shelf stability and a pleasant, creamy mouthfeel.

Rheological measurements were performed using a rheometer (Anton Paar MCR302) at 20°C. The product's viscosity at a medium shear rate (50 s^{-1}) can give an indication as to how the product will behave during swallowing ("mouthfeel"). Figure 2 (below, left diagram) shows that the viscosity of the product with 0.3% xanthan gum and 0.03% TayaGel® HA at a medium shear rate was only slightly higher than the product with xanthan gum alone. These results may indicate that the product's mouthfeel is mainly influenced by xanthan gum.

Evaluation of viscosity at a low shear rate (0.01 s^{-1}) can give an indication of the stability of a product. The diagram on the right of figure 2 reveals that the addition of TayaGel® HA significantly increased the viscosity of the oat cream at a low shear rate. This suggests that TayaGel® HA is primarily responsible for the stability of the product.

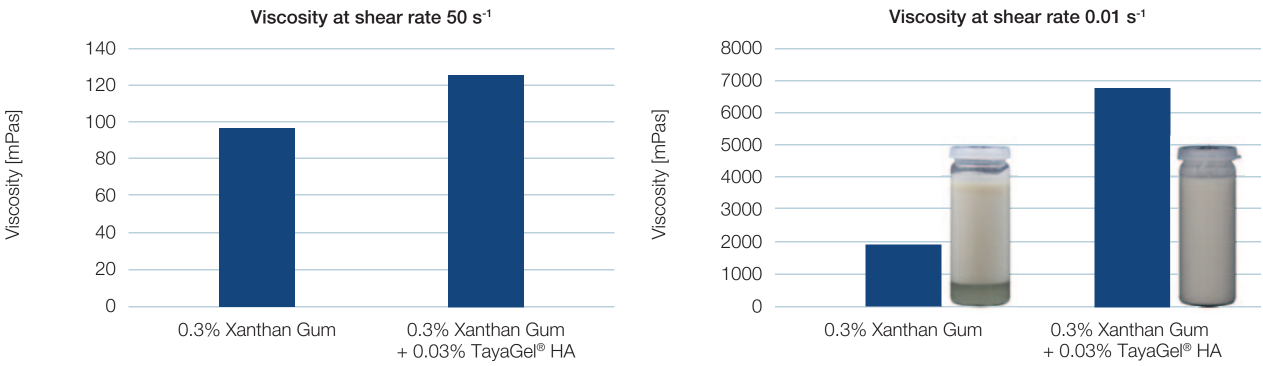

Figure 2: Viscosity of oat-based cooking creams with xanthan gum alone and with xanthan gum plus TayaGel® HA at a medium shear rate (left) and a low shear rate (right)

In order to evaluate the product's performance in a cooking application, the cream was added to an instant tomato soup. This is both a typical and a challenging environment due to its salty and acidic nature (pH 4.3), as well as the cream's exposure to boiling temperatures during cooking. A set amount of soup was boiled, then refined with the oat-based cooking cream containing 0.3% xanthan gum and 0.03% TayaGel® HA. The mixture was cooked again for three minutes. The cream added sweetness and creaminess to the tomato soup, and no visual flocculation or separation could be identified.

Conclusion

The combination of xanthan gum and TayaGel® HA in an oat-based cooking cream represents an ideal way to achieve excellent storage stability, great taste and a pleasant mouthfeel. Due to its stabilising and thickening effect, this combination of hydrocolloids enables the use of natural emulsifiers such as lecithin while avoiding strong emulsifiers such as mono- and diglycerides of fatty acids that would otherwise be necessary for long-term stability. Moreover, it was shown that the hydrocolloids can be added to the cream without any negative impact on its performance during cooking.

Cold cuts

Due to the steady rise of veganism and especially the rapidly growing number of flexitarians, plant-based meat alternatives have become a flourishing growth segment. The availability of multiple plant protein sources as bases for meat substitutes – together with corresponding technological capabilities – facilitates the provision of meat alternatives to meet this increasing demand. However, the replacement of animal-derived protein and the development of plant-based alternatives give rise to a number of challenges, especially in mimicking the complex and unique texture of meat.

Plant-based sausages are based on emulsions consisting of water, protein, fat, hydrocolloids, salt, spices, flavourings, and colourants. The term "cold cuts" is used in this study to refer to cooked and sliced sausages used for sandwiches. Along with other ingredients, hydrocolloids are very important for plant-based cold cuts, as they stabilise the emulsion during production and form a gel after heat treatment, giving a pleasant texture and bite. A suitable combination of hydrocolloids is therefore necessary to provide a sausage-like texture, including bite and sliceability.

This project focused on how Jungbunzlauer's xanthan gum can help to improve the texture of plant-based cold cuts in combination with other hydrocolloids. A basic recipe with 78% water, 11% sunflower oil, 6% pea protein, 0.22% lactic acid, salt, spices and flavourings was developed to test varying combinations and concentrations of hydrocolloids, namely xanthan gum, locust bean gum and kappa-carrageenan.

Results

To evaluate the texture of cold cut samples containing different hydrocolloid systems, texture profile analyses* were conducted using a texture analyser (TA.XTplusC[2] n=8). Cut out samples (25 x 6 mm) were placed on the measuring table and a measuring probe compressed the sample to 40% deformation, recording hardness, chewiness (figure 3) and cohesiveness (data not shown). The hardness of the sample is defined as the first peak of the recorded force; this can be interpreted as the firmness of the samples ("first bite"). The chewiness, a parameter calculated by the software*, can give an indication as to the energy required to chew the sample.

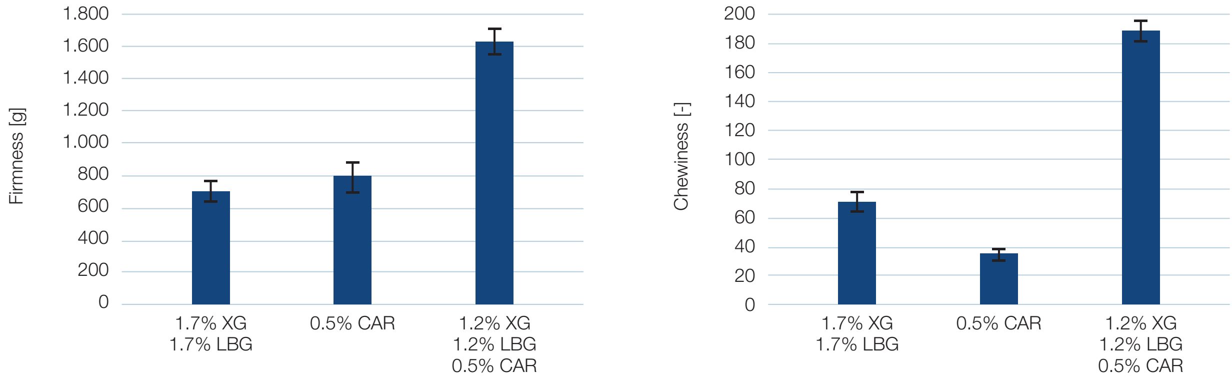

Figure 3: Firmness and chewiness of cold cuts with different hydrocolloid systems (XG = Xanthan Gum; LBG = Locust Bean Gum; CAR = Kappa-Carrageenan)

The firmness of the samples containing a combination of 1.7% xanthan gum and 1.7% locust bean gum was comparable to the samples containing carrageenan as the sole hydrocolloid (figure 3). However, the latter did not match product expectations, as the emulsion was very runny before heat treatment, resulting in settlement of spices before gelation. Moreover, the cold cut with 0.5% carrageenan was very dense in appearance, with considerable syneresis and brittleness making it poorly sliceable. In contrast, xanthan gum and locust bean gum produced samples with a stable and homogeneous emulsion. The texture was firm and cohesive, although the samples were too elastic, with little bite. This corresponded with low chewiness values. Moreover, the sliced pieces tended to stick together. Only the combination of all three hydrocolloids significantly increased the firmness and chewiness of the cold cuts. The resulting overall texture was pleasant and the bite was clearly improved by adding carrageenan, while elasticity was reduced. Furthermore, a slight increase in the cohesiveness of the cold cuts was detected when all three hydrocolloids were combined (data not shown). This might be interpreted as reduced brittleness, and was clearly demonstrated in the shape of better sliceability and easily separable slices.

Conclusion

These results show that xanthan gum in combination with locust bean gum and kappa-carrageenan results in improved textural properties in a pea protein-based cold cut. The hydrocolloid system forms a firm gel texture with typical bite and elasticity similar to meat products, and also provided excellent sliceability and separability of slices.

*Exact method available on request

Scrambled eggs

In addition to substitutes for meat and dairy products, plant-based alternatives for eggs are a growing field of interest. This is an area of interest for vegans as well as flexitarians or people who would like to reduce their egg consumption for other reasons, such as sustainability or egg protein allergies. It was a challenge for this project to find a suitable ratio of proteins and starches that would create an ideal egg base. Using the hydrocolloid TayaGel® HA (high-acyl gellan gum), two distinct plant-based egg recipes were developed: one liquid and one powdered. As mouthfeel plays a significant role in the consumer's perception of an egg substitute, the focus of the project was to improve the texture using TayaGel® HA.

Results

The hardness of both the liquid and powder formulations were tested using a texture analyser* with a special fixture for non-homogeneous samples (Kramer shear cell, n=6).[2] This measuring cell records the maximum force that is needed for a hard body to penetrate the sample to a fixed distance, thus determining its hardness.

The powder formulation was used to test whether Jungbunzlauer's glucono-delta-lactone could be used as a leavening system in the product to replace phosphate-containing ingredients. A storage stability test was conducted in which the product was stored for two months in a chamber at 40°C in airtight sachets. On the liquid formulation, a storage stability test was conducted for four weeks at 4°C in airtight containers. In addition, sensory evaluation was conducted using triangle tests.

To demonstrate the texture-improving abilities of TayaGel® HA, a liquid formulation was developed using a recipe with yellow mung beans, pea protein powder and rice starch. The recipe consisted of 64.23% water, 21.49% cooked yellow mung beans, 4.0% vegetable oil, 3.5% pea protein powder, 2.5% white rice flour, 1.55% TayaGel® HA, 1.4% nutritional yeast, 0.5% kala namak, 0.29% sodium acid pyrophosphate, 0.25% onion powder, 0.21% sodium bicarbonate, 0.05% xanthan gum FN, and 0.023% nisin. Texture analysis showed that the addition of TayaGel® HA increased the hardness of the plant-based egg samples (figure 4, samples marked "L"). A concentration of 1.55% TayaGel® HA proved ideal to increase the hardness and springiness of this base. Xanthan gum FN was used in addition to TayaGel® HA to prevent phase separation in the uncooked product. The shelf life of the product was found to be at least 4 weeks when refrigerated.

*Exact method available on request

The powder formulation was developed using a recipe with chickpea flour. The recipe consisted of 90.3% chickpea flour, 3.7% TayaGel® HA, 2.3% glucono-delta-lactone, 1.34% nutritional yeast, 1.08% sodium bicarbonate, 0.87% salt and 0.43% onion powder. Texture analysis showed that the hardness of this product increased with a greater concentration of TayaGel® HA (figure 4, samples marked "P"). A concentration of 0.85% TayaGel® HA was found to provide the ideal hardness and springiness for this base.

One of the goals of the project was to see whether glucono-delta-lactone would be a suitable phosphate substitute for the leavening system. It began reacting immediately in the liquid version, but it worked very well in the powdered version and could therefore be used in this version. A comparison between the Jungbunzlauer formulation containing regular baking powder (diphosphate and sodium bicarbonate) as the leavening system and the formulation containing 2.3% glucono-delta-lactone to replace the phosphates revealed similar levels of hardness in both products (figure 4, P-0.85% TayaGel® and P-0.85% TayaGel® 2.3% GdL 2500).

Sensory evaluation confirmed that the addition of TayaGel® HA improved texture and that glucono-delta-lactone could be used to replace phosphate in the leavening system. A powder storage test was conducted to compare the performance of the formulation with regular baking powder to that of the formulation with glucono-delta-lactone. No visual changes could be detected. Both variants appeared as free-flowing powder, and scrambling properties before and after four months of storage were found to be similar.

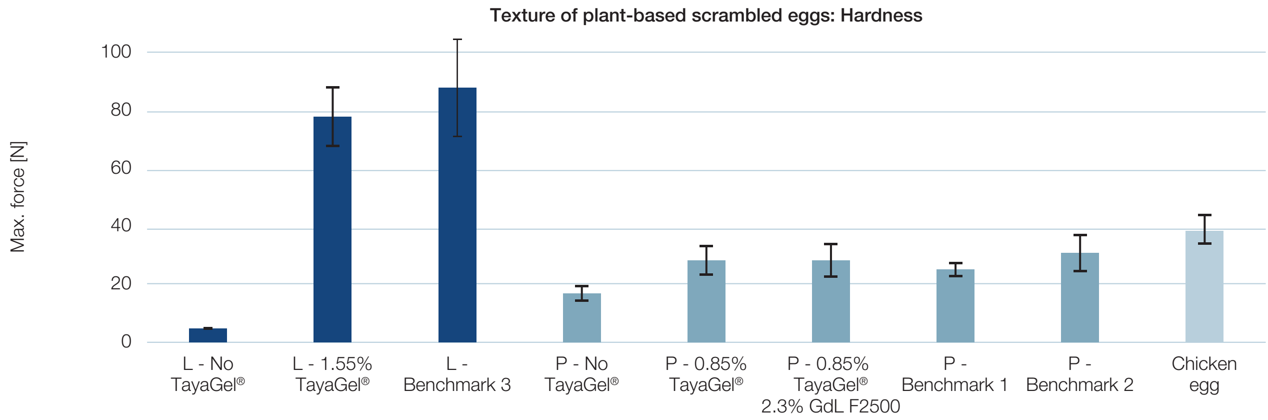

Figure 4: Hardness of plant-based scrambled egg products, liquid (L) and powder (P). Measured via Stable Micro Systems Texture Analyser using a Kramer shear cell (n=6).

Conclusion

The addition of TayaGel® HA improved the texture of both liquid and powdered forms of plant-based scrambled eggs by increasing hardness and springiness.

For the liquid form, a concentration of 1.55% TayaGel® HA was found to be the most suitable to improve the plant-based egg-substitute, which was developed using yellow mung beans, pea protein and rice starch. Xanthan gum FN was added in combination with TayaGel® HA to prevent phase separation and particle sedimentation during shelf storage. The liquid product was stable for at least four weeks when refrigerated.

For the powdered form, a concentration of 0.85% TayaGel® HA proved most suitable to improve a base made with chickpea flour. Furthermore, the results showed that glucono-delta-lactone can be used to offer a phosphate and aluminium-free leavening system. The powdered product was stable for at least four months at room temperature.

Caviar

Although plant-based seafood is currently a niche area of the plant-based food space, it shows great potential for innovation and new discoveries. One very interesting product is plant-based caviar. This is already exceptional in itself, and knowledge of how to make it could also open doors to other exciting products based on gelled hydrocolloids.

The texture of plant-based caviar was addressed in this project using a specific method of gelling hydrocolloids called spherification. Spherification is a method whereby drops of hydrocolloid-containing liquid are dripped into a calcium bath; or, in the case of reverse spherification, drops of calcium-containing liquid are dripped into a crosslinking hydrocolloid bath. In both cases, the drops of liquid gel in the bath to form gelled spheres. The gelled spheres thus obtained consist of water and a small quantity of hydrocolloids such as alginate, low acyl gellan gum and agar-agar. A very small quantity of about 1% in total weight (or even less) of these polymers is sufficient to turn liquid (water) into a gel. Gelation happens because hydrocolloids, upon reacting with calcium, produce a network structure by trapping water molecules, effectively binding two or more chains into a network structure, as illustrated in figure 5.

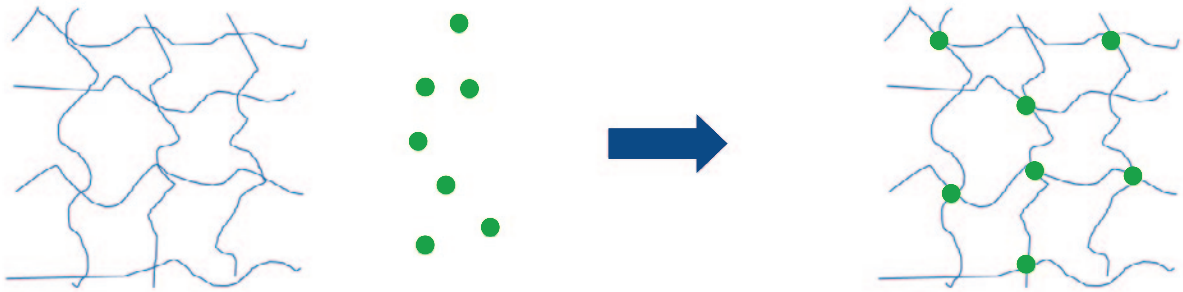

Figure 5: Diagram of crosslinking of hydrocolloids with calcium ions to form a gel[5]

The calcium salt most widely used for gelling is calcium chloride, which is an inorganic salt. Calcium chloride contains approximately 33% calcium, and is generally used in the spherification of popping and culinary pearls at concentrations of 1.5–3.0%, resulting in an effective final calcium concentration of 0.6–1%. However, calcium chloride has the disadvantage of imparting an unwanted bitter, metallic off-taste. Calcium lactate gluconate is often more suitable, as it is mostly tasteless even at high concentrations. It is the salt of a weak acid containing 13% calcium, and can be used in the spherification of popping and culinary pearls at concentrations of 4.5–8%, also resulting in an effective final calcium concentration of 0.6–1%. The speed of diffusion of calcium in a water-based solution remains constant, independent of the salt source. Therefore, crosslinking with calcium cations occurs at the same speed and diffusion, whether the cations are from calcium lactate gluconate or calcium chloride.

This project focused on improving taste while retaining the crosslinking functionality of calcium by using calcium lactate gluconate. The aim was to produce suitably textured and stable gelled spheres. A secondary goal of this project was to investigate the use of xanthan gum to improve gelation during spherification.

Results
Two different processes were used to manufacture the plant-based caviar. For direct spherification, an alginate dripping solution was dropped into a calcium bath in which the gel spheres form. For the reverse spherification process, a calcium solution was dropped into an alginate bath, where the spheres form.

The base recipe for direct spherification consisted of an alginate drip solution containing 90.15% water, 0.75% trisodium citrate, 0.05% xanthan gum FN-ST, 1.10% sub4salt®, 1.00% citric acid anhydrous, and 6.95% other solids; and a calcium bath containing 90.54% water, 9.00% calcium lactate gluconate, 0.30% citric acid anhydrous, and 0.16% other preservatives.

The base recipe for reverse spherification consisted of consisted of a calcium drip solution drip solution containing 85.85% water, 4.50% calcium lactate gluconate, 0.40% citric acid anhydrous, 1.50% sub4salt®, 0.25% xanthan gum FN-ST, and 7.5% other solids; and an alginate bath containing 99.10% water, 0.3% trisodium citrate, and 0.6% sodium alginate.

One important aspect of this application is surface tension, which is defined as cohesive forces that cause the surface of a liquid to contract to the smallest possible surface area. Cohesive forces are attractive forces between molecules of the same type, which can be strengthened by increasing the viscosity of a solution.[6,7,8,9] Surface tension is important for spherification because the drop that drips into the gelling bath must have a very similar viscosity to the gelling bath itself in order to prevent defects such as tails or teardrop shapes as shown in figure 6.

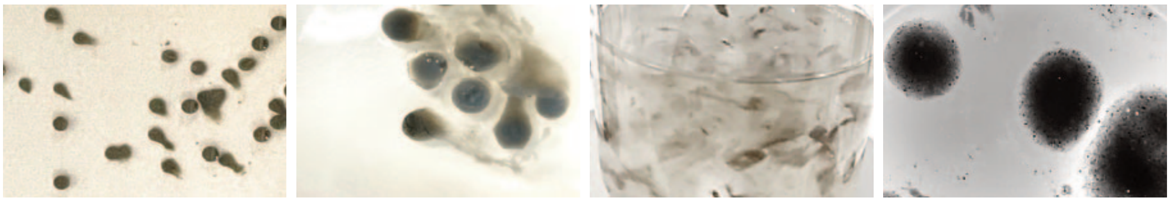

Figure 6: Left and centre left: sphere abnormalities with direct spherification: tail formation caused by low calcium bath solution viscosity (left) and teardrop shapes caused by high viscosity of the alginate drip solution (centre left). Right and centre right: sphere abnormalities with reverse spherification: splash disks caused by high alginate bath solution viscosity (centre right) and splashes caused by low calcium drip solution viscosity (right).

For spherification applications where sugar cannot be added or a higher viscosity is needed, adding a thickener such as xanthan gum to increase viscosity and cohesion results in greater surface tension.[6,7,8,9] Testing graduated amounts of xanthan gum revealed that the difference in viscosity between the gelling bath and the dripped drop should be no more than 15% in order to maintain a round sphere and prevent defects such as tailing and teardrop shapes.

In addition, sensory comparisons were performed by a trained panel, using a duo-trio difference test for plant-based caviar made with calcium chloride or calcium lactate gluconate. For both direct and reverse spherification, a reference sample with calcium lactate gluconate was compared against two blind plant-based caviar samples: one with calcium chloride and the other with calcium lactate gluconate. A significant difference in taste was found, irrespective of whether the plant-based caviar was produced by the direct or the reverse method. This was mainly due to the bitter notes associated with the calcium chloride.

Two further sensory intensity tests were performed to determine the difference in bitterness intensity between the two calcium-salt-in-water solutions. A bitterness scale for ranking samples was used, with 0 meaning “no bitterness detected” and 10 meaning “very bitter”. The first test simulated direct spherification with gelling bath calcium levels of 1.0% using either calcium chloride or calcium lactate gluconate. The second trial simulated reverse spherification with drip solution calcium levels of 0.6%, again with either calcium source. The trained panel found significant differences in bitterness perception between the calcium salts, with calcium chloride being perceived as more bitter than calcium lactate gluconate in both direct and reverse spherification calcium concentrations.

Shelf-life testing showed the crosslinks using calcium lactate gluconate are stable for at least eight weeks at room temperature after hot-fill (85ºC) packaging.

Conclusion
Xanthan gum in the dripping solution or in the gelling bath can help optimise viscosity to prevent defects such as tailing or teardrop shapes, and ultimately to create suitably textured spheres.

Calcium lactate gluconate for spherification in plant-based caviar provides a sensory taste benefit over calcium chloride, as the latter imparts a bitter taste profile. The functionality of crosslinking hydrocolloids can be maintained by adjusting the amount of calcium lactate gluconate to match the calcium content of solutions with other calcium salts.

Summary

Worldwide, consumers are increasingly including more plant-based products in their diets, often for reasons of health, sustainability and animal welfare.[10]

This paper has shown that texture and mouthfeel improved with the use of Jungbunzlauer's hydrocolloids xanthan gum and TayaGel® HA in various applications. Improvements were achieved in the foam stability and structure of an oat-based barista blend. With the help of Jungbunzlauer biogums, it proved possible to also use natural emulsifiers in cooking cream products. In cold cuts, the firm gel texture imparted by Jungbunzlauer hydrocolloids improved bite and elasticity. TayaGel® HA was ideal for enhancing the structure in liquid and powdered plant-based egg formulations. Lastly, it was successfully demonstrated that xanthan gum can be used for the spherification of popping and culinary pearls in combination with calcium lactate gluconate.

All recipe cards are available upon request.

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About Jungbunzlauer

Jungbunzlauer is one of the world's leading producers of biodegradable ingredients of natural origin. We enable our customers to manufacture healthier, safer, tastier and more sustainable products. Thanks to continuous investment, state-of-the-art manufacturing processes and comprehensive quality management, we are able to provide outstanding product quality.

Our mission "From nature to ingredients®" commits us to protecting people and their environment.

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