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# BEST PRACTICES

AWARDS

FROST & SULLIVAN

2020 BEST PRACTICES AWARD

# COMETBIO

**2020 NORTH AMERICAN SUSTAINABLE DIETARY  
FIBERS FOR FOOD AND BEVERAGE  
NEW PRODUCT INNOVATION AWARD**

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## Background and Company Performance

### *Industry Challenges*

Gastrointestinal microbiota (microorganisms) in humans' digestive tract is one of the densely populated microbial communities that provide protective, metabolic, and immunologic functions and play a crucial role in human health.<sup>12</sup> Several factors influence the microbial community in digestive tracts, such as genetics, physiology (stress, disease, and age), and environmental factors, such as the use of medications and living conditions.<sup>3</sup> Factors that hinder gastrointestinal microbiota growth in the digestive tracts can cause stomach disturbances like gas, constipation, diarrhea, bloating, and heartburn. Therefore, addressing these stomach-related health issues requires increasing gut flora population, which can be possible by providing substrates for their growth. Recent observations show that dietary fibers as an additive in food and beverage (F&B) products alter the niche environment in the digestive tract by providing substrates for microorganisms' growth, enabling them to utilize these substrates to expand their populations.<sup>4</sup>

Dietary ingredients in the market include probiotics, phytochemicals and plant extracts, fibers and specialty carbohydrates, prebiotics, omega-3 fatty acids, proteins and amino acids, and carotenoids.<sup>5</sup> Consumption of these ingredients significantly modulates the functionality and growth of microorganisms in the digestive tract. However, long-term intake of these ingredients has been noted to cause gastrointestinal distress and bloating, making these ingredients difficult for consumers to incorporate into their digestive health regimen. Also, some of the dietary ingredients contain high amounts of gluten. The long-term intake of these gluten-containing ingredients causes gut discomfort and pain from the outer muscle walls or inside the abdomen. This further restrains the long-term use of these dietary ingredients in F&B applications.

Furthermore, some dietary ingredients, such as phytochemicals, amino acids, carotenoids, and vitamins are synthetic, which on regular intake cause allergic reactions and harmful effects on the human body. Therefore, an unmet need among F&B manufacturers is the development of naturally derived (plant-derived), gluten-free, highly soluble, nonallergic-causing, superior, gastrointestinal-tolerable dietary fibers that can mediate the metabolic functions and composition of the digestive tract microbial community.

### *New Product Attributes and Customer Impact*

Comet Biorefining, Inc (Comet Bio), headquartered in London, Ontario and Schaumburg, Illinois, is a sustainable ingredients company. It has developed and commercialized a prebiotic dietary fiber, Arrabina™, intended as a non-digestible, gluten-free, high-fiber, dietary ingredient for F&B applications. Since its inception in 2009, the company has

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<sup>1</sup> Energy-balance studies reveal associations between gut microbes, caloric load, and nutrient absorption in humans, <http://dx.doi.org/10.3945/ajcn.110.01013>.

<sup>2</sup> The role of diet on intestinal microbiota metabolism: downstream impacts on host immune function and health, and therapeutic implications, <https://doi.org/10.1007/s00535-014-0953-z>.

<sup>3</sup> Metagenomic systems biology of the human gut microbiome reveals topological shifts associated with obesity and inflammatory bowel disease, <http://dx.doi.org/10.1073/pnas.1116053109>.

<sup>4</sup> Diet-microbiota interactions as moderators of human metabolism, <http://dx.doi.org/10.1038/nature18846>.

<sup>5</sup> Frost & Sullivan. April 2020. 2020 Top 50 Emerging Technologies & Growth Opportunities.

continually expanded its pipeline with new products and technologies, such as Sweeterra™ 63DE, Hemicellulose Extract (HCE), and 95DE sustainable dextrose. It turns crop leftovers into high-quality products using upcycling technology, addressing diverse market needs. Comet Bio aims to manufacture high-quality, unique, and sustainable ingredients for the F&B industry.

### **Match to Needs, Reliability and Quality**

Comet Bio has developed Arrabina in response to F&B manufacturers' growing demand for non-digestible prebiotic dietary fibers for their products to increase the stomach gut flora population. Arrabina is a fully soluble Arabinoxylan, which has been long recognized for its beneficial effects in the bran, husks and shells of many plants. But, until now, extracting Arabinoxylan in a soluble form has been very difficult. Comet Bio solved this problem with its upcycling technology. As a multifunctional dietary fiber, Arrabina is produced from non-genetically modified crops (non-GMO crops) left over after harvest. The use of crop waste to manufacture its dietary fiber distinguishes Comet Bio from other competitors that use whole plants for producing their prebiotic dietary fibers. Arrabina's formulation and performance aspects are attributed to Comet Bio's patented upcycling technology. It is a 2-step method for obtaining healthy and sustainable ingredients. Initially, the feedstock (non-GMO crop leftovers post-harvest) is put through a high-temperature process, followed by the second step of purification and filtration. Using upcycling technology for manufacturing Arrabina allows this prebiotic dietary fiber to provide several health benefits to human beings, . Arrabina helps in maintaining healthy blood glucose levels, promoting growth of beneficial bacteria in the gut, and supporting immune system health. Comet Bio's use of waste biomass to produce the Arrabina prebiotic dietary fiber matches North American consumers' demand for sustainably sourced, clean label ingredients. Frost & Sullivan research indicates that by leveraging upcycling, companies can offer the F&B market a myriad of new ingredients in the next 5 years and beyond.

Comet Bio has developed a broad range of food ingredients from biomass feedstocks. This proven experience lends high reliability to Arrabina as a GMO-free, gluten-free, and sustainable ingredient for food and beverages. Comet Bio commissioned leading research organization, BioFortis Inc's, to conduct a clinical trial on Arrabina. The clinical trial on 36 healthy individuals showed no adverse effects on their digestive systems and that consuming as much as 12 grams per day of the fiber was indistinguishable from consuming a placebo. Moreover, Comet has obtained its Self-Affirmed Generally Recognized as Safe (GRAS) status for the ingredient and has completed dossiers substantiating its front of pack claims. Moreover, Arabinoxylan is on the US Food and Drug Administration's list of approved dietary fibers for use in F&B applications.

### **Customer Acquisition, Customer Ownership Experience and Brand Equity**

Comet Bio has been increasing its customer base since Arrabina's launch and expects to expand it by more than 20% in the next 5 years. Frost & Sullivan attributes the increase to Arrabina's vital differentiating benefits compared to other commercially available dietary ingredients.

In catering to varying consumer needs, Comet Bio customizes its prebiotic dietary formulation in line with client requirements. For instance, the company can customize the nutritional profile, such as total carbohydrates, sugar, fat, protein, and soluble fiber content in the formulation according to customer demand. Comet Bio's strategy through in-house research and development (R&D) and competitive pricing, and Arrabina's gluten-free and sustainable nature compared to other commercially available dietary fibers significantly attract more customers to the company. Frost & Sullivan recognizes that Comet Bio is one of the few companies that have successfully developed sustainable, upcycled dietary ingredients derived from non-GMO harvest leftovers, such as shells, leaves, and straw. The trend gives farms and manufacturers new opportunities to reduce waste and improve their products' sustainability. Accordingly, the prebiotic dietary fiber receives constant positive feedback from clients.

Comet Bio is committed to improving its patented upcycling technology that produces the high-quality, cost-competitive ingredients to make Arrabina a compatible additive for beverages, nutritional bars, and baked goods. The company ensures that Arrabina's purity, solubility in water, stability in solution, fiber content, and arabinoxylan prebiotic flavor meet partnering clients' required standards. Comet Bio's commitment to addressing any technical challenges facing its flagship technologies and products inspires its customers' brand loyalty.

Moreover, Comet Bio partners with several local farmers and associations, including Sustainable Development Technology Canada (STDC) and the Cellulosic Sugar Producers Co-operative (CSPC), to develop future products, technologies, and goals. For instance, in April 2018, Comet Bio partnered with Canadian farmers through the CSPC. This partnership significantly helped the company in converting farm residues, such as corn stover and wheat straw, into higher-value products. Ultimately, robust R&D efforts and unmatched product characteristics provide the company with the necessary momentum to establish itself as a leader in the sustainable ingredients supplier industry. This aligns the company toward becoming a multimillion-dollar market participant in the next few years.

### *Conclusion*

With increasing customer dissatisfaction worldwide regarding the shortcomings of conventional dietary fibers, including uncontrolled blood glucose levels, high allergy risk, high amount of gluten, and toxic nature, Comet Biorefining (Comet Bio) stands out for its unique non-genetically modified, gluten-free dietary fiber product, Arrabina.

The company adopts the emerging trend of using sustainable and biobased ingredients in various food and beverages and is committed to improving any technical challenges facing upcycling in manufacturing sustainable dietary fibers. Furthermore, its policies for customer retention and acquisition by providing customized products in line with clients' requirements is increasing its market share, setting Comet Bio apart from other functional food ingredient suppliers. Compared to top market competitors, Frost & Sullivan concludes that Comet Bio's R&D approach and customer-collaboration business model can fuel its success across numerous end markets.

For its strong overall performance, Comet Biorefining is recognized with Frost & Sullivan's 2020 New Product Innovation Award.

## Significance of New Product Innovation

Ultimately, growth in any organization depends on continually introducing new products to the market and successfully commercializing those products. For these dual goals to occur, a company must be best-in-class in 3 key areas: understanding demand, nurturing the brand, and differentiating from the competition.



## Understanding New Product Innovation

Innovation is about finding a productive outlet for creativity, for consistently translating ideas into high-quality products that have a profound impact on the customer.

## *Key Benchmarking Criteria*

For the New Product Innovation Award, Frost & Sullivan analysts independently evaluated 2 key factors, New Product Attributes and Customer Impact, according to the criteria identified below.

### *New Product Attributes*

#### **Criterion 1: Match to Needs**

Requirement: Customer needs directly influence and inspire the product's design and positioning.

#### **Criterion 2: Reliability**

Requirement: The product consistently meets or exceeds customer expectations for consistent performance during its entire life cycle.

#### **Criterion 3: Quality**

Requirement: Product offers best-in-class quality, with a full complement of features and functionalities.

#### **Criterion 4: Positioning**

Requirement: The product serves a unique, unmet need that competitors cannot easily replicate.

#### **Criterion 5: Design**

Requirement: The product features an innovative design, enhancing both visual appeal and ease of use.

### *Customer Impact*

#### **Criterion 1: Price/Performance Value**

Requirement: Products or services offer the best value for the price, compared to similar offerings in the market.

#### **Criterion 2: Customer Acquisition**

Requirement: Specific product enables acquisition of new customers, even as it enhances value to current customers.

#### **Criterion 3: Customer Ownership Experience**

Requirement: Customers are proud to own the company's product or service and have a positive experience throughout the life of the product or service.

#### **Criterion 4: Customer Service Experience**

Requirement: Customer service is accessible, fast, stress-free, and of high quality.

#### **Criterion 5: Brand Equity**

Requirement: Customers have a positive view of the brand and exhibit high brand loyalty.

### Decision Support Matrix

Once all companies have been evaluated according to the Decision Support Scorecard, analysts then position the candidates on the matrix shown below, enabling them to visualize which companies are truly breakthrough and which ones are not yet operating at best-in-class levels.





## Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate award candidates and assess their fit with select best practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 <b>Monitor, target, and screen</b>	Identify award recipient candidates from around the world	<ul style="list-style-type: none"> <li>• Conduct in-depth industry research</li> <li>• Identify emerging industries</li> <li>• Scan multiple regions</li> </ul>	Pipeline of candidates that potentially meet all best practices criteria
2 <b>Perform 360-degree research</b>	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> <li>• Interview thought leaders and industry practitioners</li> <li>• Assess candidates' fit with best practices criteria</li> <li>• Rank all candidates</li> </ul>	Matrix positioning of all candidates' performance relative to one another
3 <b>Invite thought leadership in best practices</b>	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> <li>• Confirm best practices criteria</li> <li>• Examine eligibility of all candidates</li> <li>• Identify any information gaps</li> </ul>	Detailed profiles of all ranked candidates
4 <b>Initiate research director review</b>	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> <li>• Brainstorm ranking options</li> <li>• Invite multiple perspectives on candidates' performance</li> <li>• Update candidate profiles</li> </ul>	Final prioritization of all eligible candidates and companion best practices positioning paper
5 <b>Assemble panel of industry experts</b>	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> <li>• Share findings</li> <li>• Strengthen cases for candidate eligibility</li> <li>• Prioritize candidates</li> </ul>	Refined list of prioritized award candidates
6 <b>Conduct global industry review</b>	Build consensus on award candidates' eligibility	<ul style="list-style-type: none"> <li>• Hold global team meeting to review all candidates</li> <li>• Pressure-test fit with criteria</li> <li>• Confirm inclusion of all eligible candidates</li> </ul>	Final list of eligible award candidates, representing success stories worldwide
7 <b>Perform quality check</b>	Develop official award consideration materials	<ul style="list-style-type: none"> <li>• Perform final performance benchmarking activities</li> <li>• Write nominations</li> <li>• Perform quality review</li> </ul>	High-quality, accurate, and creative presentation of nominees' successes
8 <b>Reconnect with panel of industry experts</b>	Finalize the selection of the best practices award recipient	<ul style="list-style-type: none"> <li>• Review analysis with panel</li> <li>• Build consensus</li> <li>• Select recipient</li> </ul>	Decision on which company performs best against all best practices criteria
9 <b>Communicate recognition</b>	Inform award recipient of recognition	<ul style="list-style-type: none"> <li>• Announce award to the CEO</li> <li>• Inspire the organization for continued success</li> <li>• Celebrate the recipient's performance</li> </ul>	Announcement of award and plan for how recipient can use the award to enhance the brand
10 <b>Take strategic action</b>	Upon licensing, company is able to share award news with stakeholders and customers	<ul style="list-style-type: none"> <li>• Coordinate media outreach</li> <li>• Design a marketing plan</li> <li>• Assess award's role in strategic planning</li> </ul>	Widespread awareness of recipient's award status among investors, media personnel, and employees

## The Intersection between 360-Degree Research and Best Practices Awards

### Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often, companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

### 360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



## About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practices models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit <http://www.frost.com>.