



Prebiotics: Scope, Trends and Opportunities

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A presentation for

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ASSOCIATION

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Kline's services align with the requirements of our clients with a full range of services to provide insight, enhance competitiveness and achieve long-term growth

COMPETITOR ANALYSIS & INSIGHTS

- Company overview
- Key, high-level financials
- Assets, Product portfolio
- Marketing, R&D, Innovation
- Growth strategies and acquisition/alliances
- Operational strategies
- Forward-looking view

MARKET INSIGHTS

- Current supply/demand
- Market segmentation by product, region, application etc.
- Market trends, drivers and TPOC
- Current suppliers and their market position
- Market forecast

TECHNOLOGY AND INNOVATION

- Portfolio optimization
- Technology evaluation and commercialization
- Technology search
- R&D organization and processes

MANUFACTURING AND SUPPLY CHAIN

- Competitive manufacturing cost benchmarking
- Operational effectiveness/cost reduction
- End-to-end supply chain analysis

STRATEGY AND BUSINESS DEVELOPMENT

- Market opportunities
- Business unit strategies
- New business/market entry
- M&A and investment due diligence
- Competitor analysis

OUR PROJECT TEAMS ARE STAFFED WITH SEASONED MANAGEMENT CONSULTANTS AND OPERATING EXECUTIVES FROM THE SPECIFIC INDUSTRY SEGMENT

Agribusiness

Automotive

Building & Construction Materials

Chemicals & Materials

Consumer Products

Food & Nutrition

Lubricants and Specialty Petroleum

Biomaterials

Medical Devices

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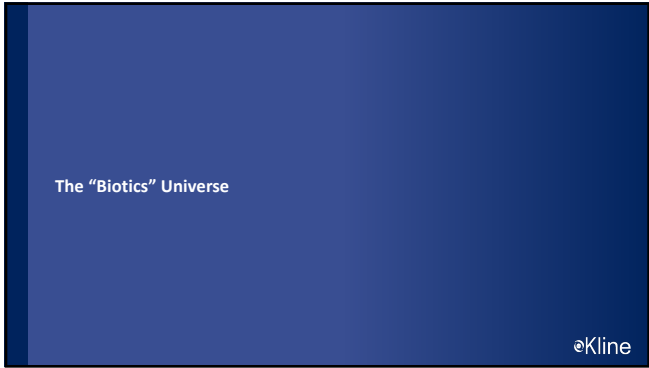
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- › The "Biotics" Universe
- › Prebiotics Market Deep Dive
- › Key Take Aways

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PROBIOTICS

PREBIOTICS

POSTBIOTICS

"Probiotics are live microorganisms that, when administered in adequate amounts, confer a health benefit on the host."

"Live microorganisms may be present in many foods and supplements, but only characterized strains with a scientifically demonstrated effect on health should be called probiotics."

Key probiotic ingredients: *Bacilli*; *Bifidobacterium*, *Lactobacilli*, *Streptococcus* and other strains (*Lactococcus*, *Enterococcus*, *Saccharomyces*)

Prebiotics are defined as a "substrate that is selectively utilized by host microorganisms conferring health benefits"

Key prebiotic ingredients: Inulin, FOS, GOS, IMO, XOS, HMO and other emerging prebiotics including polydextrose, resistant dextrin/maltodextrin, resistant starch; other oligosaccharides (specific oligosaccharides and Soybean oligosaccharides)

Proposed Postbiotic definition: "preparation of inanimate micro-organisms and/or their components that confers a health benefit on the host"¹⁶

(Definition proposed as of September 2021)

Postbiotics are non-viable microbes (whole or cell components) with or without microbial metabolites

Microbial metabolites are important components of postbiotics; however, on their own they should be referred as cell-free supernatant

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Additional source: (SAPP International Scientific Association for Probiotics and Prebiotics)

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WHAT IS THE MICROBIOME?

The human **MICROBIOME** refers to the genome of all microorganisms living in our bodies. The exact characterization, function, and interaction of microbiota with the host body are unique to each of us. A deeper understanding of the role the microbiome in the body is a vitally important research area for the development of various therapeutic solutions benefitting both physical and mental health.

The microbes that compose the human microbiome are primarily concentrated in seven regions of the body:

- Stomach
- Nose
- Mouth
- Lungs
- Skin
- Colon
- Sexual organs

Each region has a unique composition of microbes, which is unique to the individual

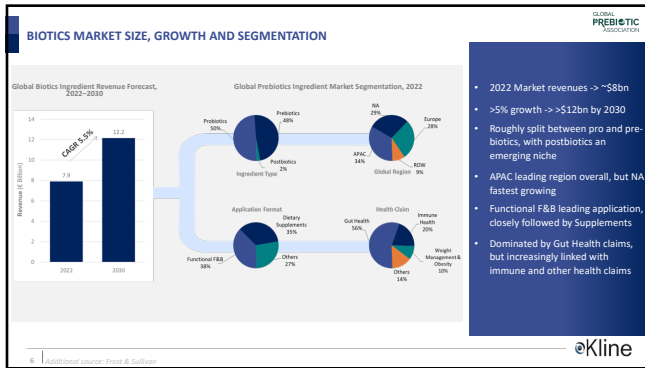
"Biotics" have the potential to optimize our individual microbiome, which could have a range of health benefits including:

Gut Health	Immune Health
Skin Health	Cognitive Health
Metabolic Disorders & Obesity	Infectious Diseases
Intimate Health	

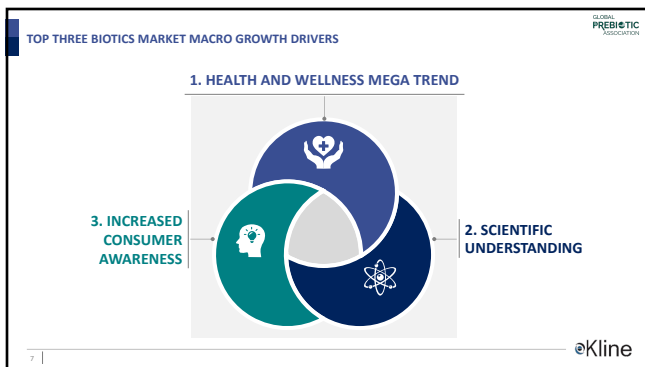
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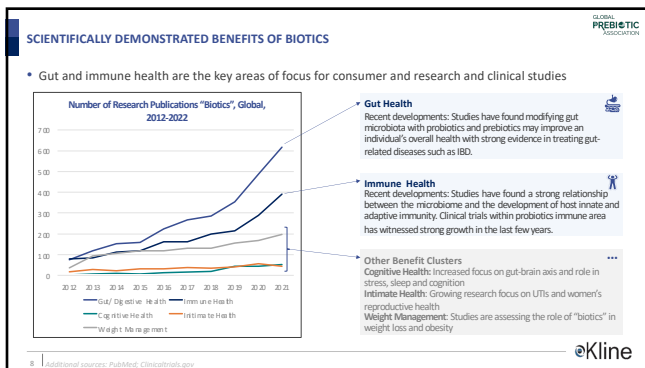
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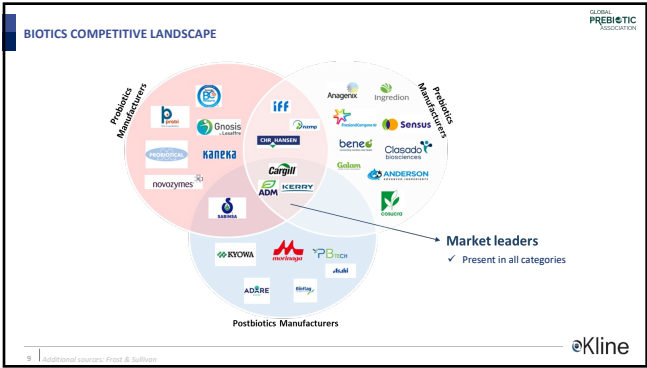
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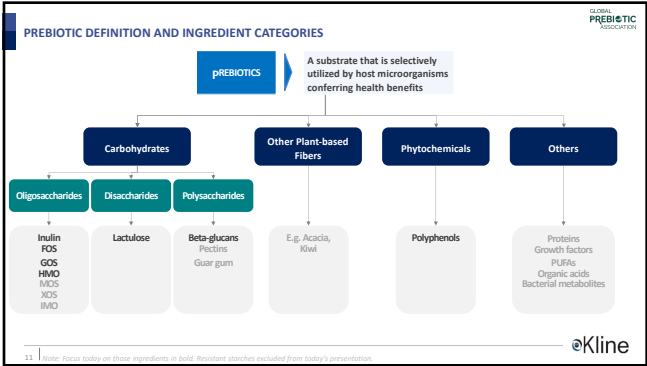
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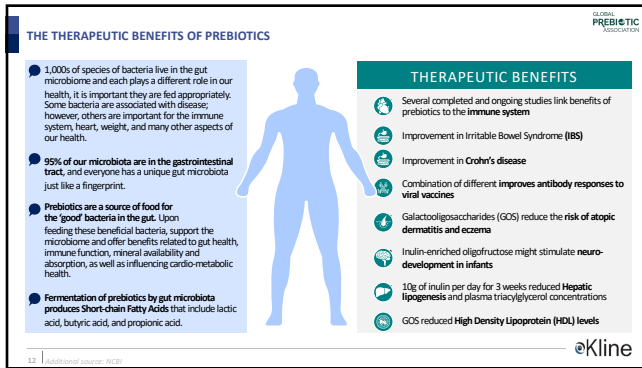
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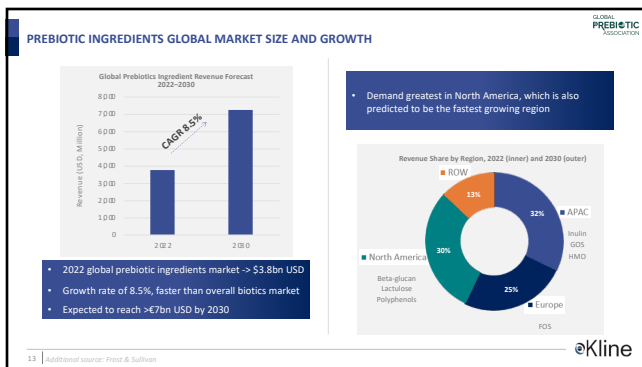
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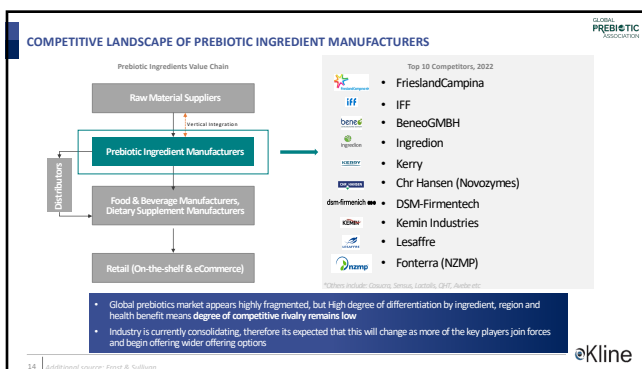
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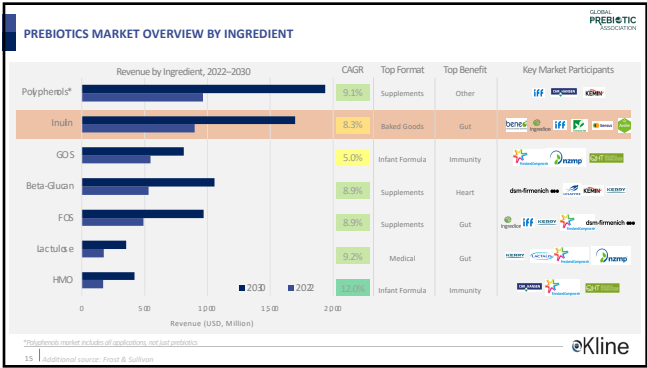
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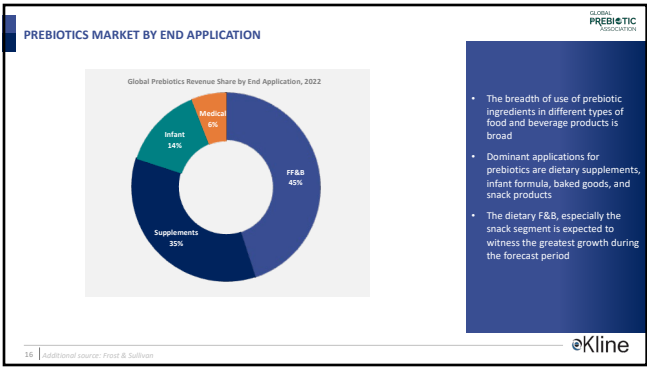
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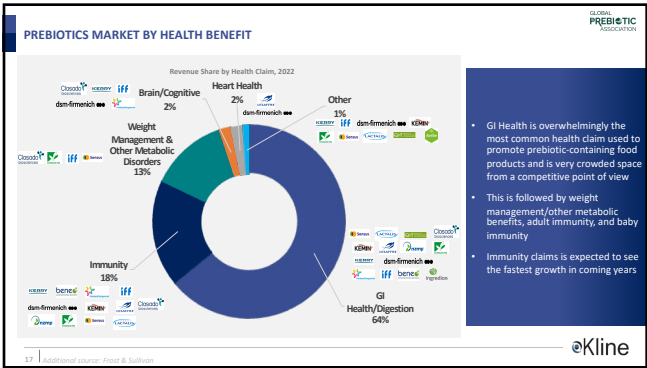
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Prebiotics Market Deep Dive: Trends

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KEY TRENDS 1: CONSUMER HEALTH FOCUS AND GROWTH IN PREBIOTIC AWARENESS ARE DRIVING INCREASED ADOPTION ACROSS ALL INGREDIENTS, FORMATS AND BENEFITS

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- **Growing and aging population**
- **Proactive health management** increasingly important, both for physical and mental health -> increasing the potential population who would take prebiotics for without an existing condition
- **Improved perception of fiber** and recognition of the fiber gap
- **Increased awareness of the role of the gut microbiome on our overall health** and how pro- and prebiotics can improve health
- **Growing incidence of chronic conditions** such as gut diseases, heart problems etc -> increasing the potential population who would benefit from prebiotics to treat an existing condition

Consumer Health Priorities:

- Immune
- Digestive
- Mental wellness
- Health aging (to ensure a good quality of life until as late as possible)



"30g of fiber recommended each day, with 5g prebiotic, in the UK it is estimated that <10% of the adult population are getting that"

British Dietetic Association

➤ Combination of these trends leads to increasing adoption and willingness to pay, although consumers increasingly also want value for money

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KEY TRENDS 2: BROADER FOOD & BEVERAGE CONSUMER TRENDS HAVE A STRONG SYNERGY WITH PREBIOTICS; THIS LINK CAN BE USED TO FURTHER DRIVE PREBIOTIC ADOPTION

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➤ Many prebiotic ingredients are a good fit with these trends, which can be highlighted by ingredient manufacturers and product formulators to promote their products and further drive penetration of prebiotics

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KEY TRENDS 3: DIGITAL TECHNOLOGIES ARE IMPACTING HOW AND WHERE CONSUMERS GAIN INSIGHT AND PURCHASE INGREDIENTS, WHICH WILL IMPACT FUTURE MARKETING STRATEGIES

CONSUMER BEHAVIOURS ARISING FROM THE DIGITAL AGE

- INFLUENCED CONSUMER**
 - Next generation consumers (Gen Z and Gen Alpha, 40% of global population by 2040)
 - Influence of social media (5 billion users by 2030)
 - 'Immersive' experiences (experience as a factor in the purchasing journey)
- IMMEDIATE CONSUMER**
 - Omnichannel enabling 'Consumption Now' models
 - Rise of Autonomous Delivery Systems is facilitating this
- INFORMED CONSUMER**
 - Rise of Digital Health, Wellness and Well Being Solutions is facilitating the proactive health management and precision nutrition
 - Technology is enabling traceability of ingredients and production processes
 - Evolving Consumer Sustainability Mindset

➤ As technology and digital living gives rise to different types of consumers, prebiotics companies need to consider what they are producing, how they are producing it and how they are engaging with consumers

Prebiotics Market Deep Dive: Opportunities

PREBIOTICS OPPORTUNITIES CAN BE FOUND IN INGREDIENTS, BENEFITS, AND FORMATS, BUT ARE ALL UNDERPINNED BY THE NEED FOR STRONG SCIENTIFIC BACKING AND CONSUMER EDUCATION

The diagram illustrates the three pillars of prebiotic opportunities: **INGREDIENTS**, **BENEFITS**, and **FORMATS**. These are represented by three colored boxes (blue, green, and orange) with corresponding icons. Arrows point from a target icon on the left to each of these three boxes. A large blue arrow on the right points from the three boxes towards a box labeled **EVIDENCE & EDUCATION**, which contains a document icon. This indicates that while ingredients, benefits, and formats are key areas for opportunity, they are all underpinned by the need for strong scientific backing and consumer education.

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PREBIOTIC INGREDIENT OPPORTUNITIES INCLUDE NOVEL SOURCES, BROAD INGREDIENT PORTFOLIOS AND PRODUCTS WITH COMPLIMENTARY COMBINATIONS OF INGREDIENTS

INGREDIENTS

Opportunities

- New prebiotics from novel sources
- Develop a portfolio of ingredients, to cater for product manufacturers who want a one-stop shop supplier who can support them to offer a range of different product offerings
- Complimentary combinations of ingredients
- Personalized/precision solutions

Requirements

- Access to raw materials
- Investment in new processing technologies
- M&A and partnerships (horizontal and vertical)

Examples of Recent Novel Prebiotic Ingredient Launches

Anagenix

Offers wholefruit derived prebiotic ingredient Unisau®, which has been clinically studied to improve IBS and IBD related symptoms

Galactos

Launched GOFOS, a FOS derived from beet sugar that not only offers gut-health related properties, but also sweetening power of up to 30%

Novel Ingredients

Offers potato-derived resistant starch ingredient, Solnu®, upcycled prebiotic ingredient for gut

72% of consumers prefer a product including a combination of pre- and probiotics

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PREBIOTIC HEALTH BENEFIT OPPORTUNITIES ARE LIMITED IN MORE MATURE MARKET SEGMENTS SUCH AS GUT HEALTH BUT DIFFERENTIATION IS STILL POSSIBLE IN OTHER SEGMENTS

BENEFITS

Opportunities

- Gut Health is increasingly more competitive
- Cognitive health/mental wellbeing and immunity areas still need more clinical research
- Differentiation still possible in other therapeutic areas such as heart health and other cardio-metabolic health

Requirements

- Portfolio expansion into ingredients targeting new health benefits
- Clinical trials
- Consumer education

Additional source: Frost & Sullivan

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PREBIOTIC FORMATS OPPORTUNITIES TAP INTO CONSUMER TRENDS AROUND PHYSICAL AND MENTAL HEALTH, AS WELL AS THE DESIRE FOR CONVENIENT, TASTY AND NATURAL PRODUCTS

FORMATS


Opportunities

- Food & beverage segments to remain the largest application as these products are seen as more "natural" by consumers
- Categories that offer convenience growing fastest
- Clinical nutrition, gummies and skin health applications also offer opportunities

Requirements

- Networks and partnerships with clients across multiple application segments
- Strong distribution networks to serve all global regions

Recent Product launch by gut health food brand Bio&Me



- The product and brands ticks the box for several consumer trends:
 - Single-serve portions for convenient, on-the-go consumption
 - No added sugar
 - High protein
 - Natural (no artificial sweeteners, thickeners or emulsifiers)
 - Scientifically backed
 - Sustainable, B-cert company
 - Prioritize consumer education

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Key Takeaways

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KEY TAKEAWAY: THE PREBIOTICS MARKET COVERS A BROAD SPECTRUM OF INGREDIENTS, WHICH WILL GROW STRONGLY IN COMING YEARS, MAINLY DUE TO THEIR LINK TO HEALTH BENEFITS. COMPANIES WITH THE RIGHT PARTNERSHIPS, CAN CAPTURE GROWTH OPPORTUNITIES, PARTICULARLY IN THE LESS CROWDED INGREDIENT, BENEFIT AND PRODUCT SEGMENTS.

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Scope

- Prebiotics fit into the broader scope of biotics and encompass a **broad portfolio of ingredients**, united under the ISAPP definition
- Thanks to **>8% growth rate**, the market could reach over €7bn USD by 2030
- Each ingredient has a unique profile** in terms of is regional split, health benefits, product format and KEY competitors
- Inulin and gut health are the most mature** and competitive segments, whilst **HMO is likely to be the fastest growing** ingredient

Trends

- Strong growth is underpinned by growing consumer awareness and improving perception of prebiotics and their health benefits**
- Ingredients and products can be linked to several key consumer health and F&B trends**
- Digital technologies are changing the way consumers access information and purchase products**, which needs to be considered for future consumer interactions

Opportunities

- Opportunities have been identified in:
 - Ingredients
 - Benefits
 - Products
- To realize any of these opportunities, **strategic partnerships** are likely to be important
- All growth opportunities will be underpinned by **increased scientific evidence base and continuing consumer education/communication**

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Thank you for listening today. Any further questions, please contact:

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