Plant-based proteins

KNOWLEDGE-BASED SOLUTIONS
More than ever, consumers are recognizing the value of protein in their diets. 

Almost a third of all food and beverage dining occasions involve the desire for protein.¹

This has led to booming demand for plant-based, protein-forward alternatives.

A PROTEIN-PACKED OPPORTUNITY

As products starring plant-based proteins gain increasing acceptance and popularity, a new world of possibilities opens. To make the most of this opportunity, developers must fully understand consumer preferences, ingredient functionality and the mechanics of taste.

THE TERM “plant-based” grew 2,462% on U.S. menus in the last 4 years²

U.S. sales of plant-based meat alternatives grew more than 23% in 2018³

The global meat alternative industry has a projected CAGR of over 25%³
What’s behind the trends?

It’s simple, really. **Today, 40% of consumers believe plant-based protein is healthier than animal protein and that it can fulfill their protein needs.**\(^4\) And while the goal of eating more healthfully is the biggest reason for the shift in attitude, many also consider it a more ethical or environmentally responsible choice.\(^5\) Either way, it’s clear that alternative proteins are no longer something at which your average person wrinkles their nose.

Most interestingly, as much as **44%** of the population now self-identifies as “flexitarian”—a significant increase from 2018 to 2019.\(^5\) This subset should continue to drive the burgeoning demand for plant-based proteins, beverages, dairy replacement and snacks.
Sure, but...what’s a flexitarian?

Flexitarians are a growing number of consumers who are trying to cut back on their overall meat consumption and add more plant-based options to their diets. While a majority are Gen Z or Millennials, flexitarians can come from any age group or demographic. Proprietary ADM research indicates their interest in plant-based proteins is primarily driven by health and nutritional reasons.5

“Younger consumers are also more likely to eschew meat altogether, and that trend is likely to grow.”
—Mintel, “Plant-Based Proteins,” May 2019

ADM conducted a market-mapping study of today’s protein alternatives. For product developers, it’s invaluable insight into the evolving flexitarian consumer.

SO, WHAT DO THEY WANT?

One of the most significant findings was that there’s still a gap between what consumers want and what they’re getting. As mentioned, nutrition is a key motivation in choosing products that feature plant-based proteins. However, flavor is also very important.

People want these new products to be just as delicious as the things they’ve always eaten.
A brand-new set of challenges

A MATTER OF TASTE
When it comes to consumer-preferred protein alternatives, it’s easy to see that nutrition and taste are king. Unfortunately, many such products fall short on the latter—and it’s something that can turn people away. So, finding a way to deliver on taste is critical for success.

AVOIDING OFF-TASTES
There’s always more to it than simply “dropping in” protein or flavor.
To craft successful plant-based food and beverage products, you need to consider the mechanics of taste.

As the chart suggests, understanding each ingredient allows you to combat off-tastes. Knowing when, how and where to leverage the right proteins, protein blends and taste technologies is key to achieving a desirable end product.

COMMON SOURCES OF OFF-TASTES

<table>
<thead>
<tr>
<th>PROTEINS BREAKDOWN</th>
<th>FAT OXIDATION</th>
<th>QUINOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>bitter, astringent,</td>
<td>rancid, green,</td>
<td>grainy, bitter</td>
</tr>
<tr>
<td>earthy, potato</td>
<td>beany</td>
<td></td>
</tr>
<tr>
<td>SOY</td>
<td>beany, oxidized</td>
<td></td>
</tr>
<tr>
<td>PEA</td>
<td>earthy, green</td>
<td></td>
</tr>
<tr>
<td>RICE</td>
<td>nutty, oxidized</td>
<td></td>
</tr>
<tr>
<td>OAT</td>
<td>grainy, cereal,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bitter</td>
<td></td>
</tr>
<tr>
<td>POTATO</td>
<td>earthy, sulfur</td>
<td></td>
</tr>
<tr>
<td>ALGAE</td>
<td>fishy, oily, umami</td>
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51% of flexitarians say their primary barrier when considering plant-based proteins is inferior taste
—ADM OutsideVoice™ Primary Research Study, 2019

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Great taste may be the key to a successful plant-based product but there are other challenges. Since health and nutrition are so important to the target consumer, it is essential to avoid creating a label with a laundry list of unnatural ingredients or one that lacks a positive nutritional profile.

From a sensory standpoint, product developers also need to be mindful of things like texture, color and functionality. Fortunately, working with the right partner can help you navigate all of these issues.

**Other considerations**

“In your opinion, why do meat substitutes require innovation or improvement?”

<table>
<thead>
<tr>
<th>Response</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
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</thead>
<tbody>
<tr>
<td>There are not enough options on the market</td>
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<tr>
<td>Taste needs to be improved</td>
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<td>They contain too many unnatural ingredients</td>
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<td>They are too expensive</td>
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<tr>
<td>Texture needs to be improved</td>
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<tr>
<td>I just like trying new things</td>
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<td>They are not good quality sources of protein</td>
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<tr>
<td>Other</td>
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By leveraging various forms of three key ingredients (soy, cashews and chickpeas) and relying on an encyclopedic knowledge base, ADM was able to craft a delicious new product and a *flexitarian’s dream come true.*

**CASE STUDY:**

“Chicken” Shawarma

**CHALLENGE**
Like plant-based proteins, ethnic flavors are on trend and growing in popularity. So, how do you create a vegan “chicken” shawarma that’s just as tasty as the genuine article?

**SOLUTION**
Textured soy proteins and a high-gelling soy protein isolate proved the perfect combination to achieve just the right bite. Low flavor-impact ingredients were chosen to let ADM’s flavor systems deliver the taste we all know and love.

Served atop a red pepper bean spread, and finished with a creamy roasted garlic sauce, this twist on a Middle Eastern classic will be a Meatless Monday favorite.
Your protein challenges solved

With over 75 years of expertise in protein and flavor design, ADM is uniquely positioned to help product developers cater to evolving consumer preferences. Think of it as a one-stop shop for all formulation needs. It comes down to a track record of plant-based protein expertise, a broad and deep ingredient portfolio, and most of all, exceptional taste.
Resources and expertise

TEXTURE
- Emulsifiers & Stabilizers
- Starches
- Plant-Based Proteins
- Pulses
- Ancient Grains
- Nuts & Seeds

Taste
- Culinary Food Bases
- Natural Flavors
- Distillates & Extracts
- Seasonings
- Maskers
- Flavor Enhancers
- Oils & Fats
- Acidulants

Nutrition
- Vegetable Powders
- Health & Wellness Solutions
- Antioxidants
- Pulses
- Ancient Grains
- Nuts & Seeds

Color
- Vegetable Powders
- Natural Colors
- Pulses

Functionality
- Acidulants
- Oils & Fats
- Starches
- Health & Wellness Solutions
- Pulses

Consumer Preferred Protein Solutions

APPLICATION CHALLENGES AND POSSIBLE SOLUTIONS

TEXTURE
Texturized proteins, other highly-functional proteins

NUTRITION
Custom solution based on nutritional targets

FUNCTIONALITY
Proteins with high solubility, water holding, gelation and emulsification properties

TASTE
Proteins with clean flavor profiles, enhanced flavor systems, improved processing conditions
A portfolio designed for what’s next

ADM’s vast array of proteins means the possibilities are endless. Each ingredient is proactively tested to learn what effects it has on taste and other sensory elements in any given scenario. It’s a huge advantage in getting products to market quickly.

Protein Portfolio Highlights

SOY
Whole – Dehulled

Flour & Grits
Standard & Identity Preserved
Expeller Pressed
Non-GMO & Organic

TVP
Standard & Identity Preserved

Textura
Standard & Identity Preserved
Non-GMO & Organic

Soy Protein Concentrates
Standard & Identity Preserved

Textured SPC
Standard & Identity Preserved
Expeller-Pressed
Non-GMO & Organic

Functional Concentrates
Standard & Identity Preserved
Expeller-Pressed
Non-GMO
Organic Concentrates

Isolates
Standard & Identity Preserved

BEANS, PEAS & PULSES

Black Beans
Chickpeas
Dark Red Kidney Beans
Fava Beans
Great Northern Beans
Green Lentil
Green Pea
Light Red Kidney Beans
Mayocoba Beans
Mung Bean
Navy Beans
Pea Protein
Pink Beans
Pinto Beans
Red Lentil
Small Red Beans
White Kidney Beans
Yellow Pea

SEEDS & NUTS

Seeds
Barley
Chia
Flax
Hemp
Pumpkin
Sesame
Spelt
Sunflower Beans

Nuts
Almonds
Brazil Nuts
Cashews
Hazelnuts
Macadamia
Peanuts
Pecans
Pine Nuts
Pistachio
Walnuts

ANCIENT GRAINS

Amaranth
Bulgur
Farro
Foni
Freekeh
Kamut
Millet
Quinoa
Rye
Sorghum
Teff
Sourcing for success

ADM partners with growers to ensure a safe, top-quality product from farm to plate.

By insisting on high processing standards and continuing to invest in emerging protein ingredients, ADM offers customers the opportunity to expand together. ADM has a global supply chain, proprietary logistics infrastructure and three U.S. application labs to help scale up solutions faster and more successfully.
Application expertise and support

A full understanding of the rapidly expanding market for plant-based proteins gives manufacturers and formulators a leg up on the competition. ADM helps answer the call for improved taste with key insights, unrivaled expertise and one of the most comprehensive ingredient portfolios in the industry.

FIND OUT MORE ABOUT ADM PLANT-BASED PROTEIN SOLUTIONS
email food@adm.com or call 844-441-FOOD

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