From Amla to Zingiber: 
Insights into Non-traditional Ingredients for Weight Management

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How We Learn About Food Today
“The greatest obstacle to discovery is not ignorance, it is the illusion of knowledge.”

Daniel Boorstin
PHYSIOLOGY OF BODY WEIGHT REGULATION:
physical activity | diet | smoking | stress | chemical exposure

GENETIC FACTORS:
heritage | hormones | cytokines | nutrigenomics
WEIGHT LOSS...KEY AREAS

Increase fat burning / increase basal metabolic rate
Regulate blood sugar and insulin
Modulate appetite (craving) / fullness
Inhibit carbohydrate/fat absorption
Inhibit inflammation

...do we know?
In American Refrigerators Today
In the digestives aisle:

- Satiety claims: not palpable, low consumer confidence
- Protein-enriched foods: often bland, not always tasty
- If it’s good for you, it must taste awful
- Imposters or misunderstood?

The food & hunger management conundrum:

- People don’t eat when they are hungry
- They don’t stop when they are full; foods just don’t satisfy
- Many eat because they want to – mindless eating, because they can

The Hunger Games
Ingredient selection basics

**KEY CONSIDERATIONS**

- Simple unambiguous message
- Effective: perceptible results
- Dieting robs the pleasure!
- Personalized?
- Resonance with emotional need
- Market acceptance: fit with industry image

**THE BASICS**

- **Taste**
- **Functionality**
- **Stability**
- **Form & Effects**
- **Regulatory Status**
- **RESULTS**

**INGREDIENT ATTRIBUTES**
Non-traditional ingredients for weight management

- **COFFEE**: Reduce hunger
- **AMLA**: Modulate sugar metabolism
- **TEA**: Reduce inflammation
- **GINGER**: Modulate fat metabolism
- **CLA**: Boost metabolism
- **CAYENNE**: Increase post-renal absorption
- **KONJAC**: Block absorption
- **SALACIA**
COFFEE, TEA, or CHOCOLATE?

- mechanism
- taste
- application
- usage level
- standardization of bioactives

- history of use
- folkloric conviction
- integration into routine
- safety & supply
ENERGY BOOSTERS

No silver bullet
Synergistic with diet & exercise
How we eat & drink

Agricultural crop/ variety
Level of bioactive components
Effect of processing
Methylxanthines: vasodilatation, diuresis & the ability to increase energy
Flavor & taste
Good chocolate/bad chocolate?
Consumer activists

A TREAT OR A MEDICINE?
<table>
<thead>
<tr>
<th>KEY PLAYERS</th>
<th>Almonds, amla (<em>Phyllanthus emblica</em>), bitter melon (<em>Momordica charantia</em>), caiapo (sweet potato), fenugreek (<em>Trigonella foenum-graecum</em>), ginger, glucomannan (<em>Konjac</em>), green tea polyphenols, L-arabinose (<em>Acacia Senegal/gum arabic</em>), Salacia <em>oblonga</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>LABEL BENEFITS</td>
<td>Plant-derived</td>
</tr>
<tr>
<td>PHYSIOLOGICAL BENEFITS</td>
<td>Perceptible effects that can also be measured</td>
</tr>
<tr>
<td></td>
<td>Physiological effects are compelling, diabetes friendly, ideal for weight management</td>
</tr>
<tr>
<td></td>
<td>Mood enhancing effects</td>
</tr>
<tr>
<td>PROS &amp; CONS</td>
<td>Credible, demonstrated, and perceptible</td>
</tr>
<tr>
<td></td>
<td>Few and benign side effects, if any</td>
</tr>
<tr>
<td></td>
<td>Diabetes friendly: low glycemic index, satiates, curbs cravings</td>
</tr>
<tr>
<td></td>
<td>Applicable across mainstream consumers</td>
</tr>
<tr>
<td></td>
<td>Suitable for gluten free, allergen-free and available in organic, kosher, and halal formats</td>
</tr>
<tr>
<td>TASTE</td>
<td>resonance with modern lifestyles</td>
</tr>
</tbody>
</table>
THE GUT-BRAIN AXIS
The role of the gut microflora and the gut fermentation on the modulation of: host metabolism | appetite | systemic low-grade inflammation | weight gain and obesity
<table>
<thead>
<tr>
<th>MODULATE APPETITE (CRAVING) / FULLNESS</th>
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<tr>
<td><strong>KEY PLAYERS</strong></td>
</tr>
<tr>
<td>Proteins—whey and soy, other plant-based proteins, Hoodia <em>gordonii</em>, almonds, amla (<em>Phyllanthus emblica</em>), caiapo (sweet potato), glucomannan (Konjac), green tea polyphenols, fenugreek (<em>Trigonella foenum-graecum</em>), fiber, hydrocolloids and gums, beta-flucans, fructo-oligosaccharides</td>
</tr>
<tr>
<td><strong>LABEL BENEFITS</strong></td>
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<td><strong>PHYSIOLOGICAL BENEFITS</strong></td>
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<tr>
<td>Perceptible effects that can also be measured</td>
</tr>
<tr>
<td>Cholecystokinin stimulators / appetite suppressants</td>
</tr>
<tr>
<td>The “second meal effect”</td>
</tr>
<tr>
<td>Cardiovascular benefits, brain / cognition health, mood enhancing effects</td>
</tr>
<tr>
<td><strong>PROS &amp; CONS</strong></td>
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<tr>
<td>Credible, demonstrated, and perceptible</td>
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<tr>
<td>Few and benign side effects, if any</td>
</tr>
<tr>
<td>Satiates and curbs cravings</td>
</tr>
<tr>
<td>Generally applicable across mainstream consumers</td>
</tr>
<tr>
<td>Most are allergen-free and available in organic, kosher, and halal formats</td>
</tr>
<tr>
<td>Many fit the gluten-free demand</td>
</tr>
<tr>
<td>TASTE</td>
</tr>
</tbody>
</table>
### INHIBIT CARBOHYDRATE / FAT ABSORPTION

<table>
<thead>
<tr>
<th>KEY PLAYERS</th>
<th>Plant-derived</th>
<th>historic/folkloric cache</th>
<th>clean label implications</th>
<th>consumers “get it”</th>
<th>value plant-derived materials &amp; bioactives over pharma and fabricated additives</th>
<th>power of suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carbohydrate blockers:</strong></td>
<td>bean extracts, green coffee, L-arabinose (gum arabic), sucrose &amp; maltose blockers, α-glucosidase blockers</td>
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<tr>
<td><strong>Fat blockers:</strong></td>
<td>lipase inhibitors (green tea, cinnamon, LMW pectin, green tea), lipase binders (fenugreek, glucomannan, Opuntia, fiber, hydrocolloids/gums)</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LABEL BENEFITS</th>
<th>Perceptible effects that can also be measured</th>
<th>Glycemic index modulators and indirect cholecystokinin stimulators / appetite suppressants</th>
<th>Overall health benefits, cardiovascular benefits, mass &amp; girth reduction</th>
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<th>PHYSIOLOGICAL BENEFITS</th>
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<th>Few and benign side effects, if any</th>
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<th>Generally applicable across mainstream consumers</th>
<th>Allergen-free</th>
<th>organic</th>
<th>kosher</th>
<th>halal</th>
<th>gluten-free</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TASTE</td>
<td>resonance with modern lifestyles</td>
<td>how to formulate</td>
<td>cost</td>
<td>dosage</td>
<td></td>
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</table>

**PROS & CONS**
INHIBIT INFLAMMATION

HOW THEY WORK
reduce hypothalamic inflammation and diet-induced weight gain
reduce cholesterol oxidation, plaque build-up, clot formation, bad cholesterol (LDL), and pro-inflammatory responses
anti-inflammatory

APPLICATIONS
spice and coloring in home cooking; color / flavor ingredient in condiments, spreads, stews, soups, curries, and frozen prepared ethnic meals; bioactive in beverages
ISSUE: persistent stains / bioavailability

PRODUCTS IN THE MARKETPLACE
Weight management products: Market challenges

• Poor understanding of ingredient suitability
• Proliferation of certain ingredients (e.g., proteins)
• Conflicting information from suppliers (e.g., turmeric)
• Confusing nomenclature
• Lack of transparency re: source, production & supply
• Dosage and cost implications
• Label implications
• Target audience perceptions
• Purity, standardization, & efficacy implications
• Resonance of application to consumer need & emotion

Source: Commercial makers of weight management products, sports drinks / performance products for athletes, and medical foods
R&D wish-list for weight management ingredients

For ALL applications:

- Completeness
- Taste/texture
- Fortifies/synergistic
- Cleans label
- Complements use
- Robustness
- Non-intrusiveness
- Allergen-free
- Affordability
- Versatility
- COMPELLING

Bakery: impact on dough attribute, yield, texture, volume

Meats: impact on taste, water-holding capacity and fat-absorption capacity

Beverages: taste, viscosity, mouthfeel, aftertaste, solubility

Food-intolerance substitutions: dairy-free, soy-free, gluten-free, vegetarian, vegan

Meal replacement: complement other ingredients, resonance with cuisine type, allergen-free, source

Confectionery: suitability, shelf-life, taste

Yogurt & dairy: water-holding capacity, texture, taste, compatibility & efficacy in low fat/high protein versions

Sports nutrition: stand-alone performance or in conjunction with other ingredients | before or after?
THE 5-STEP PLAN
from blah to a destination product

1. Start with the end in mind: ALWAYS aim to delight with great taste
2. Select multi-faceted ingredients, whenever possible
3. Check for interactions with other fellow ingredients
4. Blend culinary creativity with science-backed evidence
5. For best results, exceed expectations by addressing as many market needs and trends
KEY INSIGHTS

• TASTE | TASTE | TASTE
• science can lay a strong foundation, but science does not sell | RESULTS SELL!
• culinary /history/folklore – often more convincing than science
• people do not know or cannot express what they want
  ...but, they can tell you what they like when they see it, touch it, taste it, or FEEL it!!!
• educate your audience honestly, so they make the right choices & do not hijack your business
• only the honestly healthful will succeed in the marketplace
WHY?...

...because people are beginning to associate healthful diets as cheaper than going to doctors...

Joni Stern, Stern Ingredients
To your success in the marketplace!

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