Clean label fermented launches
Agenda

• Introduction
• Clean label trends in the fermented dairy & plant-based segment
• What is clean label to DuPont?
• How to get started…
• Q&A
Clean label trends in the fermented dairy & plant-based segment

Vernon Manuel
Drivers behind clean label

Increased consumer awareness, especially with millennials, of potential negative health effects and food scares, such as allergies of foods, containing artificial ingredients.

Consumers’ increased concern with the environment, aiming to consume more sustainable food (eg local origin, less processed food and not genetically engineered).

Improved food technology, enabling some of the same functionalities in food with fewer or more natural ingredients.

Source: Market reports and published articles, eg Innova, Medical News Today, Food Ingredients First: « Expecting more from clean label. New technology and sensory appeal key themes for future…. »
Clean label is not a passing trend – it is a movement, here to stay

*Europe is seeing a clear movement towards clean label food products, with more attention being paid to food packaging and ingredients.*

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**Top 5 countries in Europe, launching food & beverage products with clean label positioning*; 2010-18**

- **Spain**
- **France**
- **Netherlands**
- **Italy**
- **Germany**

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**Source:** *The Clean Label Guide to Europe (Ingredion)*

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**Clean label positioning contains:** Natural and Organic, No Additives/Preservatives and GMO Free

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**Food & Beverage product launches with clean label positioning1, Europe 2010-18**

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**Source:** Innova
Germany, UK and France are most active in launching clean label dairy products today

Top 10 countries, launching dairy products with clean label positioning, 2013-18

Arla Bio Nur Joghurt Erdbeere: Organic Strawberry Yogurt: **Certified organic. FSC certified. Farmer owned, care in every step from cow to you**

Germany Dec 2018

**Ingredients:** Organic yogurt (75%), organic fruits (25%) (organic strawberries (16%), organic apple puree (7.5%), organic dried strawberries (1.3%)).

Onken Naked Strawberry Yogurt: **Made only with 3 ingredients. Absolutely no additives.** Suitable for vegetarians. Gluten free.

UK, Dec 2018

**Ingredients:** Yogurt (milk) with live live cultures, strawberries (13%), sugar

Source: Innova
Consumer insights on clean label
Clean label can be confusing

...as there is no regulatory definition of what ‘clean label’ means, which can be a challenge for manufacturers.

- Lack of definition of clean label means that it may mean different things to different people.
- This, can make it difficult to navigate your brand(s) through this trend and determine how to meet consumer needs

Only contains ingredients, I recognize
“Lite” version
Contains no artificial ingredients or chemicals
Short ingredient list
Hits ideal range for sugar, protein, fat, calories
Free from ingredients I’m trying to avoid
No modified ingredients
Does not trigger any allergies or sensitivities
Consumers are not sure what clean label means, but want to know about it

According to Canadean’s study\(^1\) in 2015, just over 1/3 of consumers globally did not know what "clean label" means.

However, consumers increasingly want to recognize and understand ingredients to improve their comfort level with the food\(^2\).

**US: "What does the term 'clean label' mean to you?", 2015\(^1\)**

<table>
<thead>
<tr>
<th>Ingredient Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t know what &quot;clean label&quot; means</td>
<td>45%</td>
</tr>
<tr>
<td>Free from artificial ingredients</td>
<td>30%</td>
</tr>
<tr>
<td>Natural/organic claims</td>
<td>29%</td>
</tr>
<tr>
<td>No pesticides/chemicals/toxins</td>
<td>25%</td>
</tr>
<tr>
<td>Minimally processed</td>
<td>24%</td>
</tr>
<tr>
<td>Free from allergens</td>
<td>22%</td>
</tr>
<tr>
<td>No genetically modified organisms</td>
<td>20%</td>
</tr>
<tr>
<td>Simple/short ingredient lists</td>
<td>17%</td>
</tr>
<tr>
<td>Transparent (see through) packaging</td>
<td>6%</td>
</tr>
</tbody>
</table>

1 in 2 US, UK and German consumers **read the ingredient label** often.

7 in 10 US and UK consumers **want to know and understand the ingredient list**.

Source: [1] Canadean's global survey, Q4 2015. Over 50,000 respondents across 47 countries, 3 surveys annually.

Despite the confusion, consumers seem to be getting a better idea of what clean label is.

From 2015 to 2017, less respondents selected “I don’t know what clean label means”, up to 34%.

What does the term “Clean Label” mean to you?

<table>
<thead>
<tr>
<th>2015 Q4</th>
<th>% of TOTAL</th>
<th>2017 Q1</th>
<th>% of TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>100%</td>
<td>Total</td>
<td>100%</td>
</tr>
<tr>
<td>Natural/organic claims</td>
<td>34%</td>
<td>Natural/organic claims</td>
<td>37%</td>
</tr>
<tr>
<td>Free from artificial ingredients</td>
<td>36%</td>
<td>Free from artificial ingredients</td>
<td>40%</td>
</tr>
<tr>
<td>Minimally processed</td>
<td>16%</td>
<td>Minimally processed</td>
<td>19%</td>
</tr>
<tr>
<td>Free from allergens</td>
<td>24%</td>
<td>Free from allergens</td>
<td>26%</td>
</tr>
<tr>
<td>No pesticides/chemicals/toxins</td>
<td>31%</td>
<td>No pesticides/chemicals/toxins</td>
<td>31%</td>
</tr>
<tr>
<td>No genetically modified organisms (GMOs)</td>
<td>23%</td>
<td>No genetically modified organisms (GMOs)</td>
<td>25%</td>
</tr>
<tr>
<td>Simple/short ingredient lists</td>
<td>11%</td>
<td>Simple/short ingredient lists</td>
<td>18%</td>
</tr>
<tr>
<td>Transparent (see-through) packaging</td>
<td>7%</td>
<td>Transparent (see-through) packaging</td>
<td>12%</td>
</tr>
<tr>
<td>I don't know what &quot;clean label&quot; means</td>
<td>34%</td>
<td>I don't know what &quot;clean label&quot; means</td>
<td>30%</td>
</tr>
</tbody>
</table>

Source: GlobalData’s 2017 Q1 consumer survey; GlobalData’s 2015 Q4 consumer survey: 27,000 respondents across 36 countries.
Summarising on “Clean label”

Clean label tends to be closely associated with the following themes or concepts:

- **NATURE** – The closer to nature an ingredient or product is, the more "clean" it is perceived to be.
- **SIMPLICITY** – Less chemical and more cupboard-friendly. Simplicity and familiarity count.
- **TRANSPARENCY** – Where do ingredients come from and how are products made?
- **PROCESSING** – The more processed a food or drink is, the less "clean" it is perceived to be.

Source: Canadean: Clean Label Focus: What are Consumers Saying and What is the Industry Doing?

What is “clean label”?

"Clean label is a consumer driven movement, demanding a return to real food and transparency through authenticity. Food products containing natural, familiar, simple ingredients that are easy to recognize, understand, and pronounce. No artificial ingredients or synthetic chemicals”

Source: gocleanlabel.com
Perceptions toward the "clean label" concept, especially by younger consumers, are focused around products that are **natural** or **organic**

**Global: "What does the term 'clean label' mean to you?"**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2017</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>45%</td>
<td>38%</td>
</tr>
<tr>
<td>25-34</td>
<td>44%</td>
<td>38%</td>
</tr>
<tr>
<td>35-44</td>
<td>39%</td>
<td>36%</td>
</tr>
<tr>
<td>45-54</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>55-64</td>
<td>32%</td>
<td>30%</td>
</tr>
<tr>
<td>65+</td>
<td>27%</td>
<td>24%</td>
</tr>
</tbody>
</table>

**Source:** GlobalData's 2017 Q1 consumer survey; GlobalData's 2015 Q4 consumer survey: 27,000 respondents across 36 countries.

40% of consumers globally say **freedom from artificial ingredients** is what "clean label" means to them – the top response globally.

37% of consumers globally say the term "**clean label**" means **natural/organic claims** in 2017, up from 34% in 2015.
“Natural” claims influence consumers’ brand preference and purchasing behavior

Natural ingredients are cited as the top factor that would encourage consumers to **choose one brand over another**, with 2/3 (66%) claiming to be **interested and actively buying** food and drinks with "natural" claims.

The challenge for brands and manufacturers is to meet this desire for natural ingredients **without compromising on other product attributes**, such as **flavor or shelf life**.

Clean label can also refer to “dairy free”, driven primarily by health

The majority of consumers who claim to purchase dairy and lactose free products do so because they perceive them to be healthier.

Global: Reasons why consumers buy food and drink products with the lactose free claim?," 2017¹*

- I think they are healthier for me 51%
- I prefer the taste 29%
- I'm intolerant 21%

Global: consumers who think the following have a positive impact on their health, 2017¹

- Almonds 77%
- Hazelnuts 74%

Source: [1]GlobalData 2017 Q1 global consumer survey

Consumers also equate clean label with shorter ingredient lists

Ingredients are a key part of the "clean label" proposition. Consumers perceive products with fewer ingredients to be cleaner than those with more ingredients.

68% of consumers find the concept of a product formulated with the lowest number of ingredients possible appealing.

Source: [1] GlobalData 2017 Q1 global consumer survey;

Shorter ingredient lists are part of a "back to basics" movement that encourages consumers to think more deeply about food ingredients and food processing.

Source: Canadean: Clean Label Focus: What are Consumers Saying and What is the Industry Doing?
Consumers want to see ingredients they recognize

Consumers are not food scientists, and can be scared off by product labels, packed with ingredients that sound like they were created in a laboratory.

Transparency and familiarity matter to consumers and this is relevant to ingredient lists. According to a 2013 survey from Ketchum, 68% of global consumers want to recognize all of the ingredients on food labels.¹

"Simple ingredients from nature"
"Made of nuts, seeds, honey, tapioca, syrup & sea salt"

Source: Canadean: Clean Label Focus: What are Consumers Saying and What is the Industry Doing?
Driven by the demand for transparency and clean label, GMO-free launches are overall increasing.

US: "If you saw a food or drink with the following descriptor or claim, would you consider it to be more or less nutritious?" Q2 2015¹

Responses for "more or significantly more nutritious"

- Fresh: 72%
- Natural: 65%
- Organic: 58%
- Genetically modified: 13%

Insights on clean label at ingredient level
Above 50% of respondents consider the following ingredients natural: Soy protein, natural flavourings, fermented honey, soy fiber, rice starch, pea protein, seaweed extract, enzymes.

Above 40% of respondents consider pectin, betaine and fermented citrus juice natural as natural.

Source: Jan 2017 Clean Label Ipsos study of 2800 people
What if natural products came with a list of ingredients?

Clean label yogurt launches: pectin, citric acid, LBG and guar gum are the top 4 ingredients used

Top 15 E-numbers used in yogurt and drinking yogurt launches with clean label positioning, Europe:

1. Pectin (E440) - 1,504
2. Citric acid (E330) - 740
3. Locust bean gum (E410) - 607
4. Guar gum (E412) - 451
5. Sodium citrate (E331) - 259
6. Calcium citrate (E333) - 207
7. Carmine (E120) - 173
8. Lactic acid (E270) - 111
9. Carrageenan (E407) - 104
10. Acesulfame potassium (E950) - 102
11. Beta-carotene (E160a) (II) - 101
12. Gum from acacia tree (E414) - 85
13. Sucralose (E955) - 84
14. Potassium sorbate (E202) - 76
15. Paprika extract (E160c) - 69

Source: Innova
Clean label plant-based yogurt alternatives: pectin, citric acid, sodium citrate are top 3 ingredients used

Top 15 E-numbers used in dairy alternative yogurt launches with clean label positioning, Europe:

- Pectin E440: 718
- Citric acid E330: 509
- Sodium citrate E331: 259
- Ascorbic acid E300: 191
- Riboflavin E101: 184
- Tricalcium citrate E333: 134
- Calcium citrate E333: 95
- Locust bean gum E410: 95
- Guar gum E412: 85
- Malic acid E296: 78
- Ascorbyl palmitate E304: 63
- Carrageenan E407: 31
- Agar E406: 27
- Xanthan gum E415: 26
- Curcumin E100: 16

Source: Innova
What is Clean Label to DuPont?
# DuPont clean label solutions

**Dupont Clean Label building blocks:**

- **Clean label starches**
- Pectin
- LBG
- Proteins
- Fibers
- Flours

<table>
<thead>
<tr>
<th>Application</th>
<th>Trend</th>
<th>Dupont solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy yoghurts</td>
<td>Clean label</td>
<td>- Clean label Systems (Starch &amp; LBG) Yomix Cultures</td>
</tr>
<tr>
<td>Plant based &quot;yoghurts&quot;</td>
<td>Clean label</td>
<td>- Clean label Systems (Starch &amp; LBG) VEGE Cultures</td>
</tr>
<tr>
<td>Plant based &quot;cream cheese&quot; (spread)</td>
<td>Plant based Clean label</td>
<td>Clean label Systems (Starch &amp; LBG) VEGE Cultures Soy or pea proteins</td>
</tr>
<tr>
<td>Desserts</td>
<td>Clean label</td>
<td>Clean label Systems (Starch &amp; pectin)</td>
</tr>
<tr>
<td>Frozen dessert</td>
<td>Clean label</td>
<td></td>
</tr>
</tbody>
</table>
CLEAN LABEL HUB – WHAT

DuPont Nutrition and Health recognises that ‘Clean Label’ is not a trend but a market reality and expectation of consumers.

Strategically, DuPont Nutrition and Health has committed to evolving its portfolio of ingredients that can be considered ‘clean label’.
DuPont clean label solutions for fermented products (dairy & plant-based)
Food ingredients typically used in fresh fermented products

- Pectin
- Gelatin
- Native starch
- Modified starch
- Emulsifiers
- Milk derivatives
- Others

Considerations:
- Legislation
- Yogurt
- Fresh fermented products
- Processing technology
- Consumer demands
Some potential clean label ingredients

- Pectin
- LBG
- Native starch
- Flour
- Milk derivatives
- Agar ?
- Maltodextrin ?

Considerations:

Legislation

Yogurt Fresh fermented products

Processing technology

Consumer demands
Clean label solutions for fermented products

- GRINDSTED® Yo-Tex 1000 Series
- GRINDSTED® PECTIN AMD & SY Series
- HOLDBAC® Protective Cultures
- YO-MIX® & CHOozIT® Cultures

- GRINDSTED® PLANT-TEX YO Series
- GRINDSTED® PECTIN SY Series
- PLANT
- SUPRO® & TRUPRO® Plant Proteins
- HOLDBAC® VEGE Protective Cultures
- Danisco® VEGE Cultures

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Some clean label plant based products

Fermented oat snack
- DANISCO® VEGE 047 LYO
- GRINDSTED® Pectin PRIME 521
- GRINDSTED® PLANT-TEX YO 100
- TRUPRO® 2000 Pea Protein Isolate

Fermented almond product
- DANISCO® VEGE 033 LYO
- GRINDSTED® PLANT-TEX YO 110

Fermented oat product
- DANISCO® VEGE 068 LYO
- GRINDSTED® PLANT-TEX YO 145

Fermented oat snack
- GRINDSTED® PLANT-TEX YO 100
- Flour (tapioca), locust bean gum

Fermented almond product
- GRINDSTED® PLANT-TEX YO 110
- Starch (waxy maize), maltodextrin

Fermented oat product
- GRINDSTED® PLANT-TEX YO 145
- Starch (waxy maize), locust bean gum
Thank You
Q&A