



Sustainable Future of Food

Global Classification

Version 2.0

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About Us

Tematica Research, LLC (“**Tematica**”) provides financial institutions, independent Registered Investment Advisors (RIAs) and self-directed investors with equity research, economic insights, and investment ideas based upon its proprietary thematic perspective of the world and financial markets.

At the core of everything Tematica does is the company’s thematic lens, which has given rise to Tematica’s investment themes. The investment themes are identified by looking at the intersection of shifting economics, demographics, psychographics and technologies, mixed in with regulatory mandates and other forces. Such thematic shifts cut across sectors and tend to result in major structural changes and disruptions to behaviors and business models.

Our thematic research process aims to identify those companies poised to leapfrog ahead of the competition, riding the tailwinds from one or more of these themes.

1. Tematica’s approach to thematic investing

Thematic investing is exactly what it sounds like: making investment decisions based upon enduring themes. Tematica’s investment themes are identified by looking at the intersection of shifting economics, demographics, psychographics and technologies, mixed in with regulatory mandates and other forces to identify sustainable and structural market shifts. These shifts shape and impact consumer behavior and, in turn, force companies to make fundamental changes to their businesses in order to succeed.

Some companies will adapt their business models and survive (Coca-Cola Co.), a few will embrace the change more fully and leapfrog ahead of the pack (Netflix moving away from DVDs to a streaming subscription business model) while others will utterly upend the way things have always been done (Amazon), and then there are those new entrants that shake everything up (DocuSign), riding these thematic tailwinds to profits while enjoying significant share price gains. Some will sadly be left floundering as they entirely misread the changing thematic winds and become irrelevant (Kodak).

The process Tematica utilizes to analyze and assess the impact of its investment themes on a company's business model produces an enormous amount of data — data that can be licensed in the form of several Thematic Universes or through several Thematic Indices that have been created.

1.1. How are stocks thematically scored?

For each of its investment themes, Tematica maintains a database of individual stocks that have been thematically scored against the investment theme. This thematic universe of securities is compiled using screening tools and is updated twice per annum.

Included are global publicly-listed companies trading on major international exchanges that meet the following criteria as of the last trading day of the month prior to compilation:

- Market Capitalization of \$75 million and over
- Share Price greater than or equal to \$5
- 90-day average dollar value traded of at least \$750,000

The scores represent the extent of a company's exposure to the investment theme. Each company's exposure to an investment theme is determined using publicly available data provided by the company through 10-Ks, 10-Qs, 20-Fs, 8-Ks and other SEC or similar filings, quarterly earnings reports, company presentations or official earnings conference call transcripts, and if need be, through direct engagement with the company should clarification be required with respect to publicly-disclosed information.

A company's thematic exposure is measured by the percentage of financial metrics, such as operating profit, or operating metrics influenced by the tailwinds or headwinds generated from each theme. If operating profit isn't available, reported net sales data, either through official filings, transcripts or company presentations, is utilized as a proxy for exposure. If, in analyzing a company's public materials, it is clear that its operations are benefiting from a theme, but no specific operating profit or revenue data is reported that can verify the extent to which the company is benefiting from the theme, the company receives a Level 1 score for its thematic exposure.

Level 1 The company has peripheral exposure to the theme, no specific operating profit or revenue data is reported that can verify the extent to which the company is benefiting from the theme

Level 2	The company generates between 20% and 50% of its reported operating profit or revenue from the theme
Level 3	The company generates between 50% and 80% of its reported operating profit or revenue from the theme
Level 4	The company generates between 80% and 90% of its reported operating profit or revenue from the theme
Level 5	The company generates between 90% and 100% of its reported operating profit or revenue from the theme

If a constituent or prospective constituent company (or professional advisor acting on behalf of the company) wishes to challenge its score, supporting evidence should be sent to customerservice@tematicaresearch.com. The reasons for proposing a change of the company's thematic score should be stated with documentary evidence in support of the claim submitted. In considering the claim, Tematica may only take account of publicly available information.

Any adjustment resulting from a change in a company's score will be effective in line with the next semi-annual review. In certain circumstances, Tematica reserves the right to exercise discretion and apply the change sooner. Where discretion is being applied, Tematica will provide a minimum of two days' advance notice.

Tematica does not accept any form of compensation or payment from companies or third parties to rate or include their stocks within any Thematic or Industry Universe.

2. Sustainable Future of Food - Global Classification

2.1. Industry Universe

Tematica launched the Tematica Research Sustainable Future of Food Stock Universe ("**Industry Universe**") in 2020. As of July 2020, the Industry Universe contained 158 companies.

The Industry Universe captures the individual stocks that have been thematically scored across Tematica's "*Sustainable Future of Food*" investment theme as per the methodology prescribed in Section 1.1. above.

Each company's thematic score is determined by reference to its exposure to one of the 9 sub-sectors identified by Tematica as being central to the Sustainable Future of Food investment theme (see Section 2.2. below).

2.2. Background and Classification

With global resources dwindling and the population growing, the challenge of providing sustainable, nutritious and healthy food to a growing, urbanizing population more efficiently while also reducing the environmental and climatic damage to the planet is intensifying. By 2050, global food systems will need to meet the dietary demands of more than 10 billion vs. 7.8 billion people exiting 2019.

The World Resources Institute warned in its [2019 report](#):

“If today’s levels of production efficiency were to remain constant through 2050, then feeding the planet would entail clearing most of the world’s remaining forests, wiping out thousands more species, and releasing enough GHG emissions to exceed the 1.5°C and 2°C warming targets enshrined in the Paris Agreement - even if emissions from all other human activities were entirely eliminated.”

The increasing instances of obesity and related diseases are making consumers more health-conscious and they are demanding food and beverage products that are natural and low in fat and calorie content. Roughly 387 million people are living with diabetes, and according to the International Diabetes Federation, that number is expected to soar to nearly 600 million by 2035. Studies claim a whole-food, plant based diet can prevent and even reverse a litany of food and lifestyle-borne illnesses, including heart disease and type 2 diabetes. At the same time, consumer preference is shifting away from animal products largely due to rising concerns about animal welfare, personal health, and importantly, sustainability. The United Nations Food and Agriculture Organization (FAO) estimates that livestock production is responsible for 14.5% of global greenhouse gas emissions, while other organizations like the World Watch Institute have estimated it could be as much as 51%.

Against this backdrop, the Industry Universe is designed to capture companies innovating across the food value chain that are (1) advancing agri-science and digital and precision farming and water-management technologies to produce food more efficiently, with less input resources and with a reduced environmental impact and carbon footprint than traditional methods; (2) addressing the growing demands of conscious consumers for foods that are natural and organic and plant based proteins and foods which are increasingly proven to be both healthier for humans and have a much reduced impact on forests, biodiversity and carbon emissions than animal protein; or (3) innovating key areas of the food value chain such as in food and ingredient safety and testing, and sustainable, reusable and recyclable packaging solutions that help improve environmental outcomes, such as reducing single-use plastic pollution and promoting a more circular economy.

Within the Industry Universe, companies are classified according to the Tematica Research Sustainable Future of Food Global Classification (“**Classification**”). The Classification is a global market segmentation which has been designed for the investment and research communities with the objective of identifying the companies, sub-sectors and business activities of companies whose commercial models are benefiting from the structural shift towards more sustainable production and consumption within the food value chain globally.

Within the Classification, companies are classified according to whether they fit within one of the following sub-sectors:

1. Plant Based Foods and Organic Foods

Companies in this Sub-Sector are predominantly focussed on producing and delivering plant based foods and plant based alternatives to meat and dairy in the form of novel food and beverage formulations. Within this Sub-Sector, we aim to exclude companies that produce products comprised of land-reared meat (including beef, lamb, pork and poultry) and capture companies that are predominantly plant based, as evidenced by their product sets and public disclosures.

- **Plant Based Foods:** The plant based food market is anticipated to reach a market valuation of \$38.4 billion by 2025, expanding at a CAGR of 8.94% over the forecast period of 2019-2025.¹ As consumer awareness continues to grow in relation to the negative impacts of meat production (in particular, cattle) on the environment and climate (forest/habitat loss and methane emissions, waste discharge and freshwater usage), the conditions in which animals are farmed and the growing evidence that plant based foods are healthier for humans, demand for plant based foods is anticipated to grow exponentially over the coming years.
- **Organic Foods:** The demand for organic foods is expected to continue to grow as consumers continue to better understand the impact of intense agricultural practices which overly rely on chemical-based crop protection products and nitrogen, phosphate and/or potassium fertilizers to maximise yields at the expense of the health of the soil and the end consumer.

2. Ingredients, Flavors and Fragrances

Companies in this Sub-Sector are engaged in addressing the increasing demand for natural and organic ingredients in the production of both flavors and fragrances. The advent and embracement of the organic produce trend among the population of all demographics is being met by rapid food innovation among major players in the flavors and fragrances market. According to the Plant Based Foods Association, the number one driver of all food purchases is taste. The reproduction of common colors, flavor scents and increasingly, emulsifiers, has been long practiced at an industrial level in the food industry. Synthetic reproduction of certain flavors, scents and emulsifiers (like palm oil) can help alleviate not only some of the environmental impacts of growing those base inputs but also provide relief to any number of child and/or other disadvantaged workers globally. Further, as more food becomes plant based, there will be more demand for the colors, flavours and scents that consumers have grown accustomed to and these products will become a larger part of the science of food. Consumers are also increasingly seeking colors, flavors, fragrances and other ingredients that are organic, contain less sodium, are gluten-free and are non-GMO (genetically modified organisms).

3. Food Safety and Testing

¹ Source: UnivDatos Market Insights (UMI), 2019

Companies in this Sub-Sector are engaged in providing food safety solutions such as cleaning and sanitation systems and anti-microbial products utilised in the processing of food and beverages. This Sub-Sector also includes companies engaged in the provision of instruments, software and/or services related to the testing of food, soil and/or water (or a combination of the above). In food applications, diagnostic solutions are typically provided to food producers and processors who utilise them to test for potential contaminants, whether chemical (e.g. pesticides), viral, bacterial or microbiological, pathogens, toxins, allergens and drug residues as well as genetic modification and species verification. In environmental applications, such solutions are used in a number of applications including the analysis of chemical pollutants in air, water and soil.

4. Precision Farming

Companies in this Sub-Sector are engaged in agricultural innovation through new technologies which are principally aimed at increasing the quantity and quality of crops produced on the same amount of land, improving efficiencies in the use of input resources (such as crop protection products, fertilisers, water and fuel), reducing the negative impact of external / environmental risk factors (e.g. single weather events, climate change and labour shortages) and reducing the environmental footprint of agriculture. Such technologies include:

- **Precision Farming Technologies:** This refers to machinery such as GPS enabled self-driving tractors incorporating robotic and AI technology for precision planting, weeding, irrigation and harvesting and application of fertilisers and crop-protection products.
- **Digital / Smart Farming and Internet of Things:** This refers to the network of physical objects (tractors, drones, satellites) outfitted with sensors and farm-management software that enable data collection and aggregation for the purpose of field monitoring and data management. Drones take high quality images and satellites capture the bigger picture, which can be used to assess environmental conditions (such as moisture), monitor and make assessments throughout the growing cycle and predict yields in order to better inform on-farm strategy and practices.
- **Indoor, Vertical, Aeroponic, Hydroponic and Aquaponic Farming:** This refers to the technologies being used to grow crops without soil in nutrient-rich solutions and in increasingly closed loop systems which has the benefit of reducing run-off, reducing (and in many cases eliminating) the need for crop-protection products and saving both water and money.

5. Agricultural Science

Companies in this Sub-Sector are engaged in the maximization of crop yields and the optimization of input resources through science and technology, including seed science (gene editing and breeding technologies, but not gene modification), fertilizers and crop protection

products. While companies in this Sub-Sector are scored against their exposure to agri-science as a whole, companies engaged in the production of nitrogen, phosphate and/or potassium fertilizers and chemical-based crop protection products are only included if they are also engaged in the transition to bio-based solutions, noting that the foregoing typically dominate revenues for the time being. Accordingly, a company's public disclosures are assessed for clear statements confirming the company's involvement in the research, development and commercialization of bio-based crop protection products and bio-stimulants which are considered to have more favorable environmental outcomes.

6. Land Based Aquaculture

Companies in this Sub-Sector are engaged in land based production of fish (as opposed to sea based production or commercial fishing) where the growing environment and all inputs and outputs can be controlled. As the worldwide demand for farmed salmon continues to grow alongside the growing awareness of the negative environmental impacts of sea based fish farming, it is anticipated that demand for fish raised on land based farms (as opposed to sea based farms) will continue to increase. By controlling the growing environment, land based fish farming allows for the elimination of sea lice, toxic algae and other external environmental factors that can negatively impact yields. It also eliminates the negative impacts of sea based farms on the natural environment where waste, sea lice and chemicals are discharged directly into the ocean, negatively impacting wild salmon stocks. Finally, land based farming creates opportunities for the recycling of fish waste which can be utilised as fertilizer for food crops and the creation of renewable energy in the form of biogas. Recirculating Aquaculture Systems (RAS) are a growing area of innovation within the land based aquaculture industry.

7. Water Technology

Companies in this Sub-Sector are engaged in the provision of irrigation technologies aimed at minimizing the use of water in agriculture, including the development of advanced precision irrigation systems and IOT technologies that facilitate variable rate irrigation, wireless irrigation and the use of GPS positioning and guidance, which can be controlled remotely on smart devices. This segment also includes on-farm water management technologies that enhance the efficient use of water on farms, including the reuse of non-potable/grey water.

8. Supply Chain Technology

Companies in this Sub-Sector are engaged in the development of food processing technologies, such as cleaning, peeling, sorting and packing technologies that are supplied to food and beverage producers and grocery retailers. This Sub-Sector also captures companies that provide logistics technologies to the companies operating throughout the food value chain, such as automated warehouse logistics solutions.

According to the UN Food and Agricultural Organization (FAO), over a third of all food produced globally is wasted. Accordingly, the continued adoption of processing and logistics technologies throughout the food value chain is vital to reducing the amount of food wasted and thus helping to reduce food prices and carbon emissions.

9. Sustainable Packaging

Companies in this Sub-Sector are engaged in the production of food packaging that is both sustainable and either reusable, recyclable or compostable. This would include companies engaged in fiber-based packaging derived from sustainable forestry, companies producing packaging materials out of aluminum and glass, which are both infinitely recyclable, and companies producing packaging materials from recycled organic matter that is compostable. As consumer demand and legislation continue to drive demand for more sustainable packaging solutions, this Sub-Sector is anticipated to innovate and grow substantially in the future.

If a company has exposure to more than one Sub-Sector, it will be scored by reference to its collective exposure to all applicable Sub-Sectors but will be classified within (i.e. allocated to) the Sub-Sector that provides the largest percentage of the company's reported operating profit or revenue.

It is possible that additional Sub-Sectors are added in the future as the Sustainable Future of Food investment theme evolves.

3. Review Frequency

During each semi-annual scoring session, Tematica will review a company's Classification and Thematic Score in March and September.

4. Oversight and Governance

The Classification is maintained by the Tematica Research Classification Committee. The Tematica Research Classification Committee also engages in regular dialogue with the Tematica Research Strategic Advisory Board.

Please visit www.tematicaresearch.com for further information.