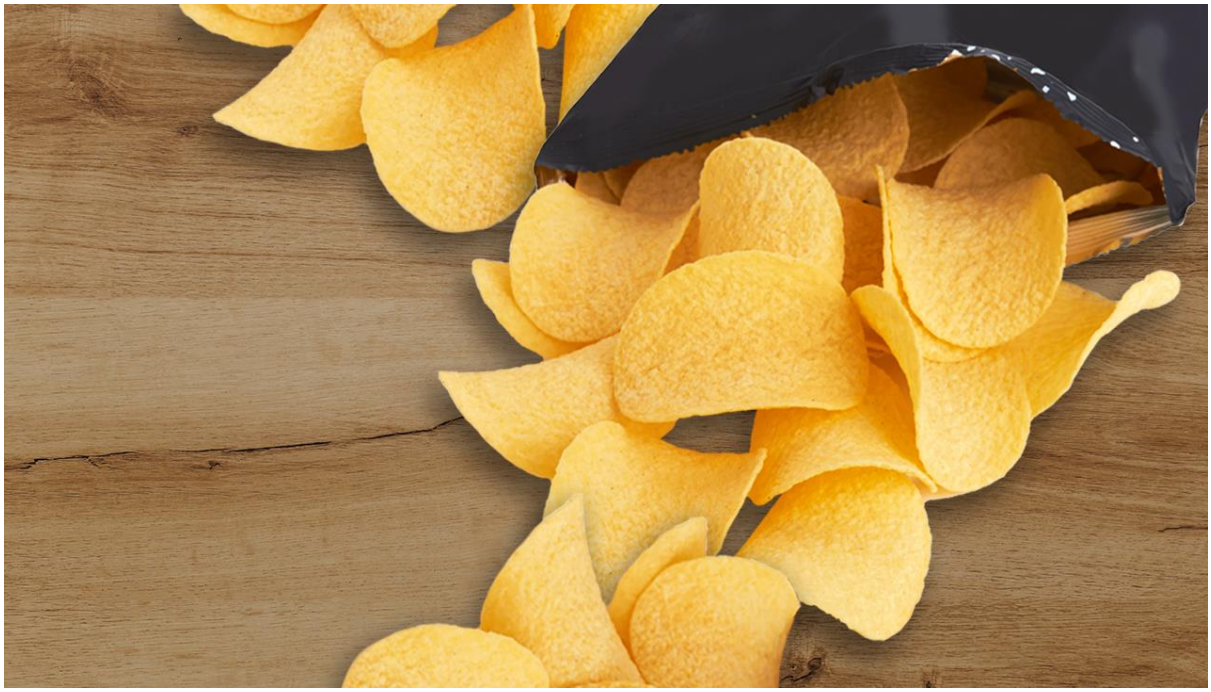
Innovative Packaging Technologies and Features in Snack Food Segment



Snack Food Packaging Market

Consumers these days are consuming more packaged snack food products, which in turn drives demand for more innovative and efficient packaging solutions[4].

According to Transparency Market Research[14]:

- The global snack food packaging market was valued at US$17 Billion in 2020
- It is estimated to grow at a CAGR of 4.3% from 2021 to 2031
- The global snack food packaging market is expected to reach the market value of US$ 25.9 Billion by the end of 2031

Snacking is a personal affair for many consumers as some use it as a stress relief while some regard it as a solution to curb their hunger during working hours[1]. According to the Hartman Group analysts, there are various approaches, needs, and attitudes applied by consumers towards snacking[1,13]:

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Innovation in Snack Product Packaging

Sustainability or Transparency in Packaging

Adopting sustainable packaging material and implementing more eco-friendly practices in the processing of snack products has become a growing movement to reduce carbon footprint to the environment[8].

- As consumers begin to demand for transparency, snack producers are forced to highlight their product's benefits through high-impact visual and messaging on their packaging. This may boost consumer confidence in a brand and at the same time assist consumers to make an immediate brief assessment on the product's quality[7].
- Flexible packaging offers a range of sustainability benefits such as material reduction, light weight and source reduction, as well as shelf-life extension, throughout a product's life cycle[11].
- Another sustainable packaging option that is available for snacks is recyclable materials or made with recycled material, compostable and biodegradable[12].

- For example, using recycled materials is not only sustainable, but also more economical. Manufacturers only need to pay the cost for recycling old ones instead of buying new materials[5].

Combination of Active & MAP Packaging

Due to high fat or oil content in snack foods, different packaging material would be required depending on the product characteristics and type. The packaging materials also must possess a good barrier against moisture, oxygen, and light and able to hold inert gases that is aimed to reduce the oxidation process[8].

- Active packaging refers to the incorporation of active component into the package that releases or absorbs substances from food or the environment to maintain or extend the product quality and shelf-life. For example, nitrogen and CO2 is added into the packaging which in turn displaces the oxygen to reduce food spoilage issue[2].
- Innovations in Modified-Atmosphere Packaging (MAP) and active, enhanced-barrier packaging materials are two key elements in maintaining product freshness and thus ensuring package safety. Moisture prevention is key here.

Nanotechnology, innovation of intelligent and active packaging

- A recent improvement in food packaging known as nanotechnology enhances the mechanical and barrier properties of food packages, detecting pathogens along with offering active and intelligent packaging systems to maintain quality and safety aspects[4].
- Active packaging uses a nanotechnology to incorporate active ingredients into food packaging materials while the carrier components interacts with internal or external factors to stimulate action. Thus, it will extend the food shelf life and improve food quality and safety[9].

- In intelligent packaging systems, the nanotechnology-based indicator or sensor(s) are integrated into food packages and reacted with internal (food ingredients and headspace) and external environmental factors[9].

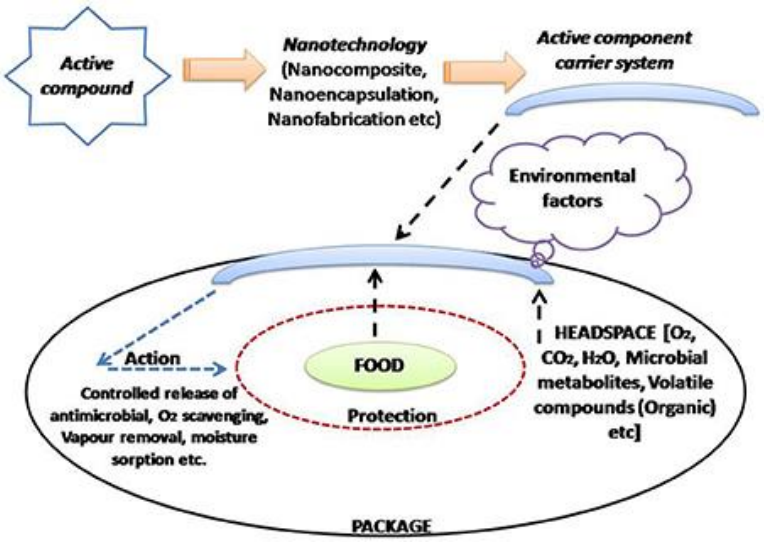

Figure 1. Active packaging and its association with nanotechnology[6,9]

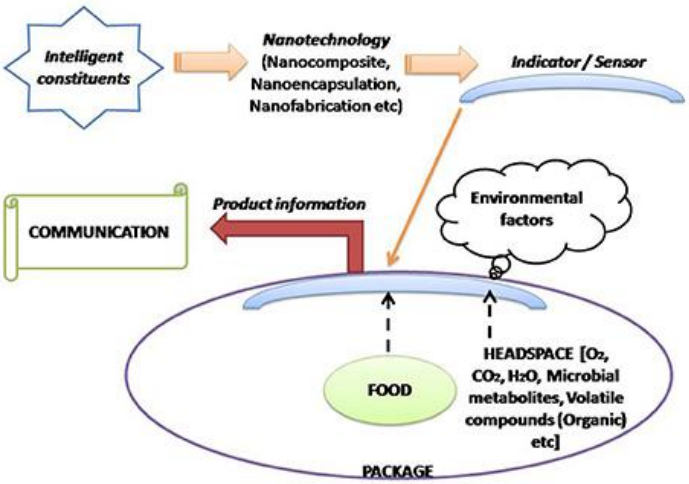

Figure 2. Demonstration of intelligent packaging concept and its association with nanotechnology[6,9]

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Factors That Influence Customer Purchase in the Snack Food segment

Customers' purchasing decision can be influenced by a myriad of factors. Packaging can also play a role in capturing consumer attention [15].

Packaging Attributes	Implications
Packaging Materials	• Convenience features such as recyclability or eco-friendly, easy-open, and portability is linked with the package material along with successful packaging design[15].
Packaging Information	• Usage instruction, nutritional value, country of origin and manufacturer information is essential in providing the required information about a product so that it is significant enough for a customer to make an easy decision before purchasing the product[15].
Packaging Appearance	• Colour, graphic, size and shape of packaging will deliver a unique and creative package to attract customers' purchase intention of snack food[15].

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