



Delivering nutrition, long shelf-life and protection

Michael Sawayda - global food marketing director, packaging coatings at Sherwin-Williams - discusses the benefits of canned foods and how coatings play a vital role in maintaining the lifespan of a can's contents.

Light metal packaging is accessible and affordable. Cans are 100 per cent recyclable and are an excellent solution for consumers and brands looking for sustainable packaging. In addition, canned goods, and the coatings that line the cans, play a crucial role in maintaining nutrition, increasing shelf-life and protecting consumer health. (1)

NUTRITION

Metal packaging helps deliver nutritious food year-round to consumers throughout the world. Canned foods provide the same – and sometimes more – nourishment as fresh and frozen options according to the Can Manufacturers Institute. (2) Canned fruits and vegetables are picked when ripe and then canned within four hours, locking in the flavour and nutrition values, (3) which can otherwise degrade over time for fresh foods that are shipped to markets. Fresh produce typically takes 24 days to arrive at a grocery store after being picked in the field, meaning its nutrients are no longer at their peak when purchased. However, the nutrients in canned foods remain stable because they are protected from the deteriorating effects of oxygen, without requiring the addition of preservatives. (4)

A variety of studies have found that canning food helps to maintain nutrient value. The retort sterilization (high heat) process used to package foods in metal cans is a critical function compared to other packaging methods. This process helps to retain the availability of certain nutrients found in fruits, vegetables and proteins. (1) A study conducted on behalf of the Canned Food Alliance, as reported by the University of Michigan, found that vitamin A content becomes more available in canned packaging for vegetables, which is shown in the table below. (5)

PER CENT CHANGE (DRY WEIGHT) IN TOTAL PROVITAMIN A DUE TO CANNING

COMMODITY	TOTAL PROVITAMIN A
Carrots	16% increase*
Collard Greens	50% increase
Spinach	19% increase
Sweet potato	22% increase

*The increases demonstrated in this table are a result of improved vitamin A availability. The data is sourced from a Canned Food Alliance study conducted by Rickman, Bruhn and Barrett.

The University of Illinois' Department of Food Science and Human Nutrition also conducted a study on the nutrients of fruits and vegetables in canned, frozen and fresh varieties. The study's fundamental findings about the canning process include:

- "Little vitamin A is lost and in some cases is higher than its raw form due to preparations and/or brine solutions.
- Some vitamin C is lost, however most of what is lost ends up in the brine solution and remains stable during the one- to two-year shelf-life of the product."

A third study determined that antinutrients, such as lectins, can be removed during the heating process of canned food. Less lectins can help with the digestibility of food. The consensus of these studies is that canned fruits and vegetables are important for a healthy diet. (5)

SHELF-STABLE

Metal packaging extends the life of fruits, vegetables and proteins. While fresh produce can spoil, canned foods are a reliable source of nutrition. In the table at the bottom of the page, view the shelf-life difference between canned and fresh foods. (6, 7, 8)

FOOD SAFETY

The metal can is one of the safest solutions for preserving food and preventing the growth of microorganisms that cause foodborne illnesses. The World Health Organization (WHO) estimates that 600 million people have gotten sick after eating contaminated food, (9) but there has not been a single documented incidence of foodborne illness from failure of metal packaging in more than 40 years. (10) Light and oxygen are the two main causes of food spoilage. Metal cans provide protection against these threats, (1) and also generate barriers to microbiological contamination during the canning process. (5)

ENHANCED PROTECTION WITH PACKAGING COATINGS

Can coatings or linings – used inside metal cans – play a critical role in delivering nutritional benefits, shelf-stability and safety. Coatings minimise interactions between the metal packaging and food. High-performance can linings must be formulated to "withstand the production and sterilization

processes, prevent chemical migration into food quantities, resist aggressive food types to protect the metal and preserve food and maintain its properties over several years." (11)

Epoxy resins, one of the most common types of can linings, have a proven track record in terms of application, manufacturability and food protection. Non-BPA epoxy solutions meet the industry's increasing need for standard performance without the use of BPA for shelf-stable light metal packaging. With performance equal to traditional epoxies, including corrosion resistance and protection for flavour and sensory performance, non-BPA epoxy options can also meet stringent international regulatory requirements for food and safety and are approved for use in most packaging applications. (1) Other non-BPA coating technologies, such as polyesters, are also available, which bring a wider portfolio of solutions to the food can industry.

CONCLUSION

Without can coatings, food packed in metal containers would not retain a multi-year shelf life, food integrity would decrease, and food spoilage and the occurrence of serious bacteria-related illnesses, such as botulism, could increase. Light metal packaging for canned products that are lined with packaging coatings help maintain nutrition levels for food, improve shelf-life and deliver the needed protection to keep food safe for consumption. 

REFERENCES:

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PRODUCT	CANNED	FRESH (REFRIGERATED)
Fruits	Up to 18 months	Few days to several weeks
Vegetables	2 - 5 years	Few days to several weeks
Proteins	2 - 5 years	1 day - 2 week
Ready to eat meals (soups, stews)	2 - 5 years	3 - 4 days