

The Global Market for Carotenoids

June 2018 • FOD025F • Andrew McWilliams

- The global market for Carotenoids reached nearly \$1.5 billion in 2017 and should reach \$2.0 billion by 2022, at a compound annual growth rate (CAGR) of 5.7% for the period of 2017-2022.
- Capsanthin market for carotenoids reached \$300.0 million in 2017 and should reach \$385.0 million by 2022 at a CAGR of 5.1% through 2022.
- Astaxanthin market for carotenoids reached \$288.7 million in 2017 and should reach \$426.9 million by 2022 at a CAGR of 8.1% through 2022.



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Chapter 1: Introduction

Study Goals and Objectives

The goal of this study is to provide a detailed overview of the commercial carotenoid industry. Its specific objectives include analyzing the relative competitiveness of individual carotenoids, the relevance of different production systems, and application segments, regional distribution and dominant players.

Reasons for Doing This Study

This report is an update of the BCC Research report FOD025E, The Global Market for Carotenoids, which was published in 2015. While no new types of carotenoids have come on the market in the last two years and no fundamentally new manufacturing technology has been introduced, the market for carotenoids has changed significantly for some product segments. Prices have dropped for a number of products while market value has risen for others.

Producers and users of carotenoids need an up-to-date analysis of the current situation and a well-documented forecast for future trends in the industry as the basis for their strategic and business planning. The report may also help players in other ingredient markets that are considering diversifying to determine whether carotenoids would be a good fit.

Scope of Report

The report reviews the global markets for the following commercialized carotenoids:

- Annatto.
- Astaxanthin.
- Beta-carotene.
- Beta-apo-8-carotenal.
- Beta-apo-8-carotenal-ester.
- Canthaxanthin.
- Capsanthin and paprika extract.
- Lutein.
- Lycopene.
- Zeaxanthin.

Information Sources

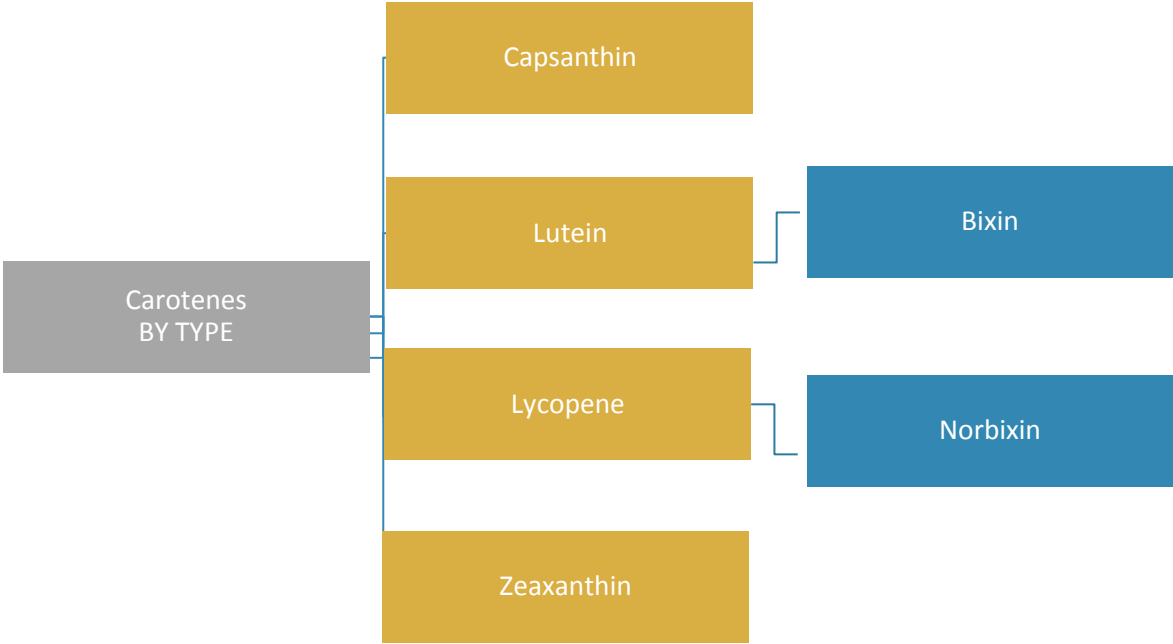
Both primary and secondary research methodologies were used to prepare this study. There is a vast amount of public information on the topic, with the exception of production volumes and technologies on carotenoids. Aside from corporate annual reports, product brochures and other published documents, direct contact between the analyst and representatives of the relevant industry provides

reliable and quantitative information on all aspects of carotenoids, ensuring the high reliability of the data contained in this report.

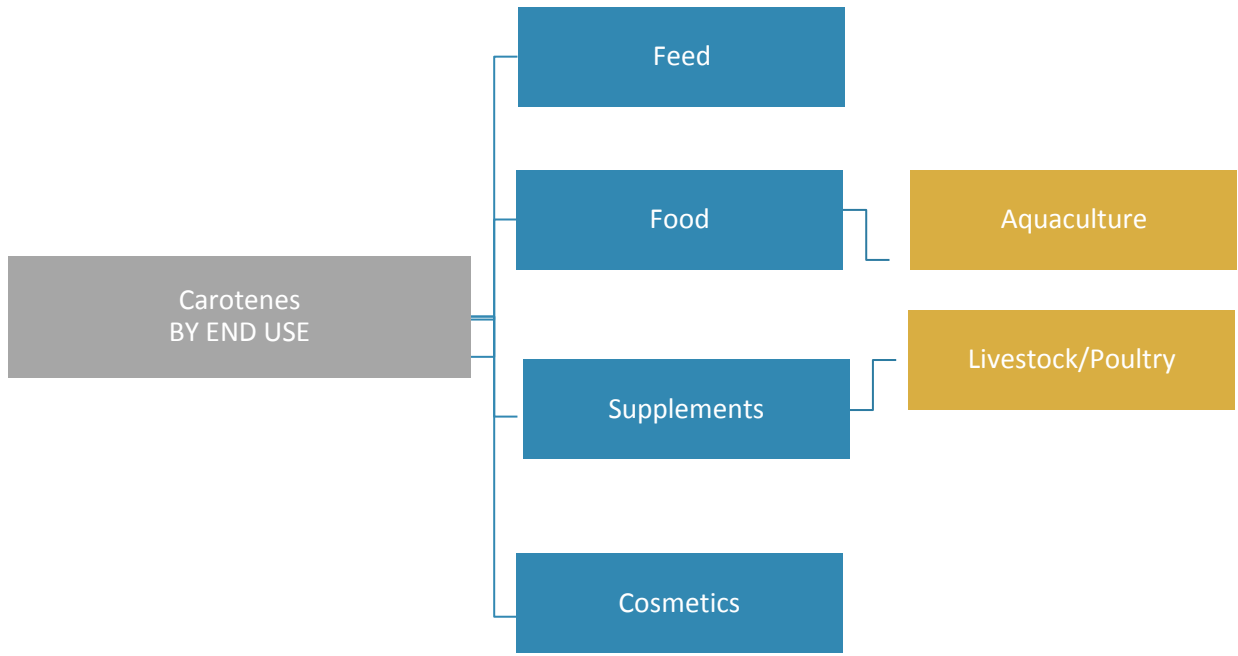
Methodology

The methodology applied in this report is based on both the analysis of the manufacturing industry and the user community. The user community is composed of companies active in the typical application segments of food, feed and supplements and, to a smaller extent, cosmetics. The report identifies application trends from past years and analyzes company strategies and behavior. Insight into usage patterns is provided, leading to preliminary estimates on quantities used and market values of specific products. Such information is cross-checked with production data from manufacturers. A detailed analysis of manufacturing patterns provides information on formulation trends and on how products are marketed. Considering framework conditions that affect future demand, estimates on developments in specific carotenoids are provided, leading to forecasts through 2022.

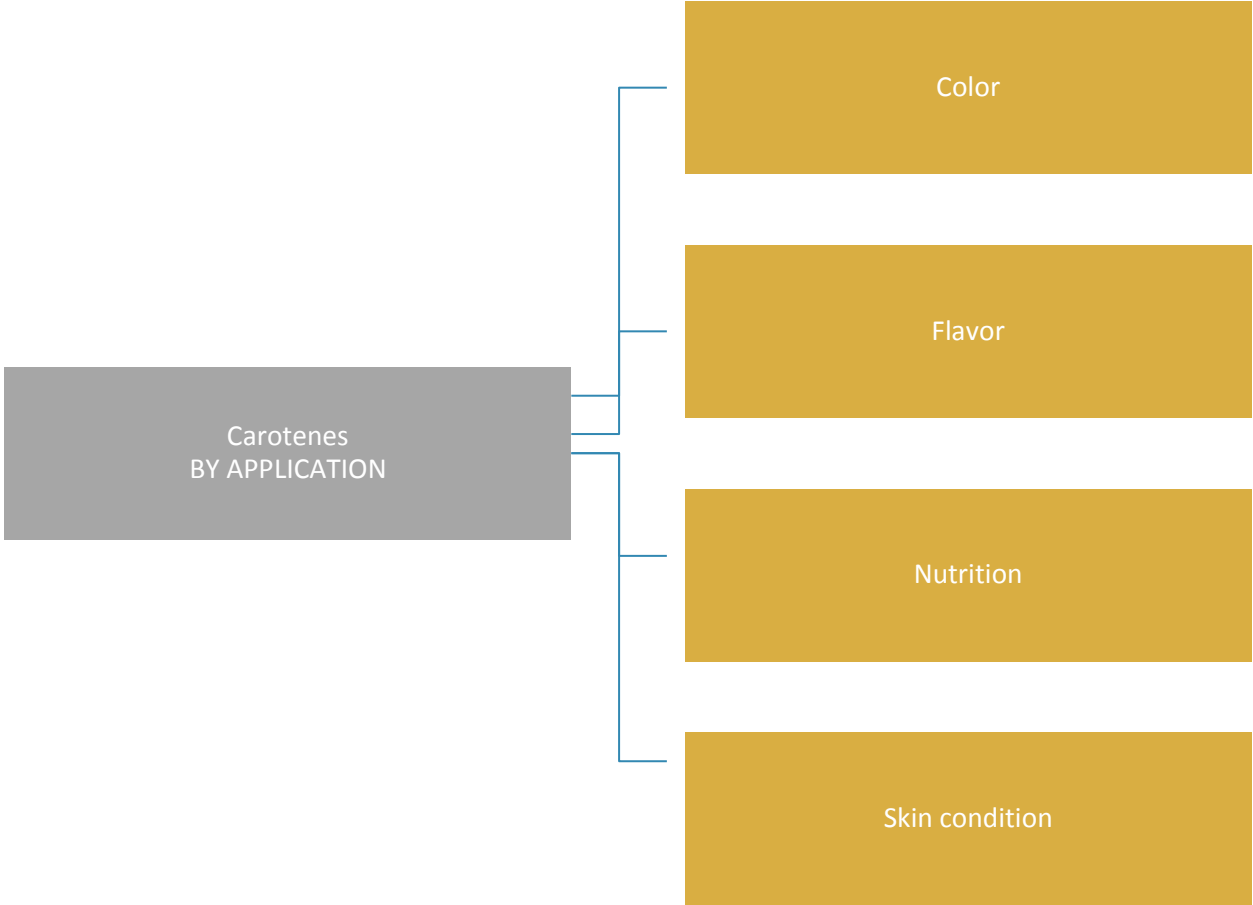
Carotenes by Type



Carotenes by End Use



Carotenes by Application



Analyst's Credentials

The author of the original report on which this update is based is Dr. Ulrich März. Dr. März graduated in 1984 as an agro-economist from the University of Stuttgart, Germany. After working for 10 years in the fine chemical industry, Dr. März started an independent consulting business for the food, feed and agro-processing industry. His specialties are the evaluation of the food, feed and supplement ingredient markets, the design and market introduction of biotechnologically derived products, and the economics of fermentation processes.

The analyst responsible for updating the report is Andrew McWilliams, a partner in the Boston-based international technology and marketing consulting firm, 43rd Parallel LLC. Mr. McWilliams is the author of numerous other BCC Research market analyses, including report CHM034C -- The Global Market for Flavors and Fragrances.

Related BCC Research Reports

- CHM053C *Yeasts, Yeast Extracts, Autolysates and Related Products: The Global Market.*
- FOD020E *World Markets for Fermentation Ingredients.*
- FOD009F *The Global Market for Food Additives.*

Chapter 2: Summary and Highlights

Carotenoids are one of the most important ingredient families for food, feed and supplements. Overall, the carotenoid market is expected to grow from approximately \$REDACTED billion in 2016 to \$REDACTED billion in 2017 and \$REDACTED billion by 2022, representing a compound annual growth rate (CAGR) of REDACTED % from 2017 through 2022.

Summary Table
Global Carotenoid Market, by Product Type, Through 2022
(\$ Millions)

Product Type	2016	2017	2022	CAGR% 2017-2022
Capsanthin	285.0			
Astaxanthin	267.5			
Beta-carotene	246.2			
Lutein	225.0			
Annatto	170.0			
Lycopene	107.0			
Canthaxanthin	72.3			
Zeaxanthin	45.9			
Beta-apo-8-carotenal	22.5			
Beta-apo-8-carotenal-ester	5.0			
Total*	1,446.4			

*Note: Totals in this report's tables might not match exactly because of rounding.

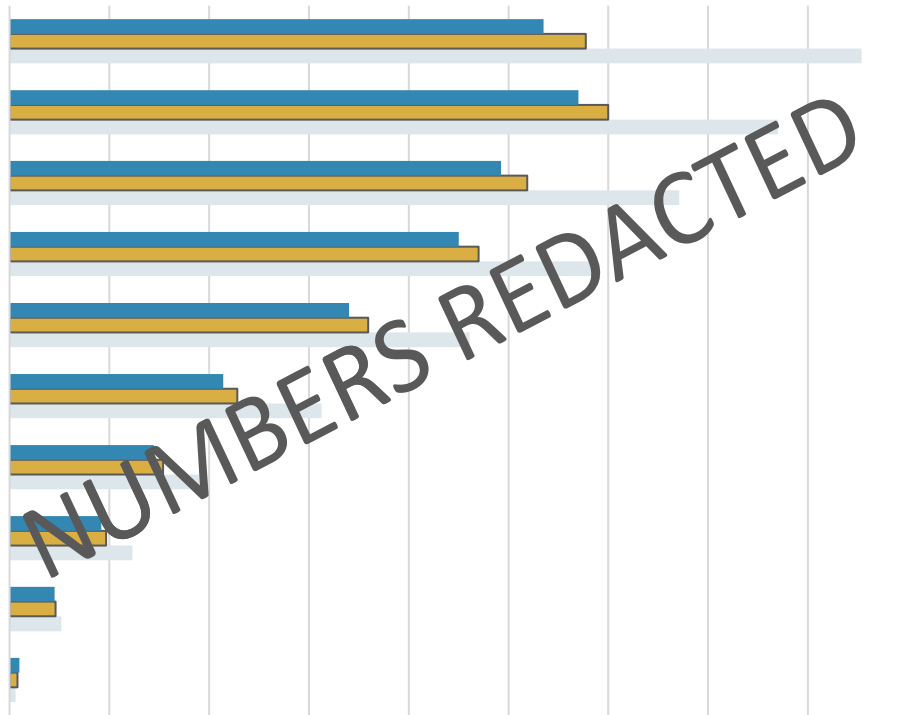
Source: BCC Research

Capsanthin had the largest market of any carotenoid in 2016, with a worth of \$REDACTED million, although it is expected to surrender the leadership position to astaxanthin by 2022. Capsanthin, the active coloring principal of paprika, is the color of choice for a number of food products and as a result has enjoyed strong growth in recent years. In feed, where the product is also used to impart a red color to eggs and broiler skin, capsanthin's competitive position has weakened vis-à-vis canthaxanthin. Capsanthin is one of the few carotenoid products for which prices have been stable for many years. Capsanthin's total market value is projected to reach \$REDACTED million by 2022.

Astaxanthin, a carotenoid widely used to pigment salmon and trout, had a market value of \$REDACTED million in 2016. The global market for astaxanthin is benefiting from astaxanthin's popularity in supplements, where it is being promoted as a potent antioxidant to fight a number of diseases. Astaxanthin is also expected to benefit from increasing prices in the years ahead, pushing its market value to \$REDACTED million in 2016, putting it at the top of the carotenoid market ahead of capsanthin in value terms.

The market value for beta-carotene, which was \$REDACTED million in 2016, should reach \$REDACTED million in 2017 and \$REDACTED million in 2022, making it the third-largest segment of the carotenoid market in value terms. Consumption of beta-carotene has been increasing steadily, but falling prices severely eroded the segment's value between 2010 and 2014. Prices appeared to stabilize between 2014 and 2016, however, and BCC Research expects the price of most beta-carotene products to increase between 2016 and 2022, contributing to a positive market outlook.

Summary Figure
Global Carotenoid Market, by Product Type, 2016-2022
(\$ Millions)



Source: BCC Research

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