

BASF
We create chemistry

# Flour Fortification
## An Investment in the Future

The fortification of staple foods such as flour is an effective public health strategy to improve micronutrient intake in populations at risk of deficiency.

At BASF, we are driven by a clear purpose: to help build a healthier future by improving access to micronutrients, e.g. vitamin A. Through our high-quality, reliable product solutions, we enable food fortification and thereby help to close nutritional gaps.

We see adequate vitamin supply not only as a nutritional necessity, but as an investment in long-term well-being and better lives for millions of people worldwide.

## Why Fortify Flour?

Flour is a widely consumed staple food across all population groups, making it an ideal vehicle for micronutrient fortification. However, enriching flour with fat-soluble nutrients such as vitamin A presents technical challenges and requires a carefully developed vitamin A powder formulation.

The formulation must ensure excellent homogeneity within the flour matrix and deliver high stability throughout storage. This is achieved through microencapsulation of vitamin A combined with alpha-tocopherol as an antioxidant (no BHT added).

## BASF Product Solutions

BASF is a leading producer of highly stable vitamin A offering a specific powder formulation for the fortification of flour:

**Dry Vitamin A-Palmitate 250 FP CWD**
Retest period: 24 months

The product contains 250,000 IU/g of vitamin A. It has been optimized for providing homogeneity and stability in corn flour and wheat flour.

## BASF Testing Solution

To test for the vitamin A content of fortified flour, BASF has developed a semi-quantitative test kit.

It is easy to use and allows fast screening of flour for the presence of vitamin A at low cost.

## Flour Fortification Principle

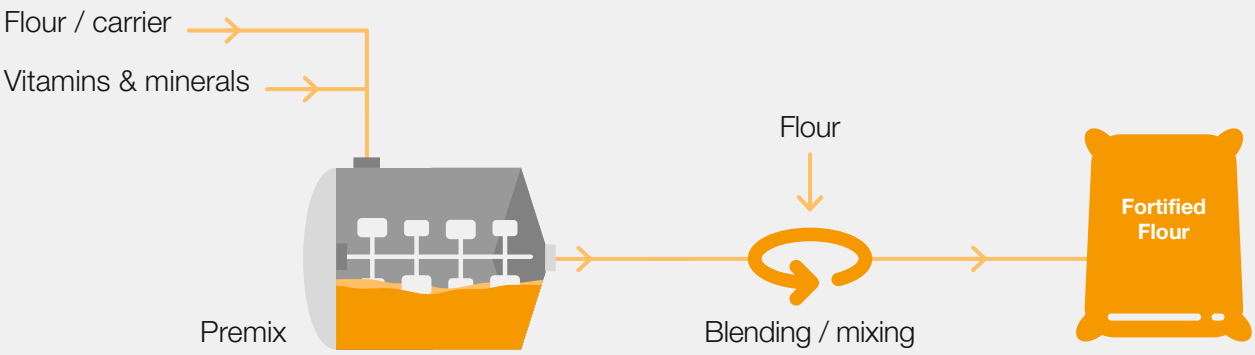
During flour fortification, vitamin A powder is first uniformly blended with a small portion of flour, along with other vitamins and minerals, to create a premix. This premix is then incorporated into the bulk flour.

To ensure accurate dosing and prevent issues such as bridging and component segregation within the feeder, the selection of suitable feeding equipment is critical and should be tailored to the physical properties of the premix.

Typically, the premix is combined with flour using a continuous high-speed mixer. When equipped with suitable mixing tools, this process ensures a high-quality blend with uniform distribution of vitamin A.

It is important to note that the specific measures required to minimize segregation depend largely on the design and operating conditions of the individual production facility.

### Flour Fortification Process




Please note: local legislations on fortification of flour with vitamin A may vary and need to be considered.

## Product Stability

The stability of vitamin A is strongly influenced by particle size of the powder. BASF's Dry Vitamin A Palmitate 250 FP CWD is a microencapsulated vitamin A beadlet powder with an optimized particle size profile to meet stringent stability requirements.

Larger particle sizes generally provide enhanced stability, as they result in a lower total surface area relative to the overall mass compared to conventional spray-dried products.

**For information about other vitamins for food fortification, and applications in oil, milk or sugar, please contact us.**

### Stability of Vitamin A Palmitate in Flour

Comparison of products without and with BHT

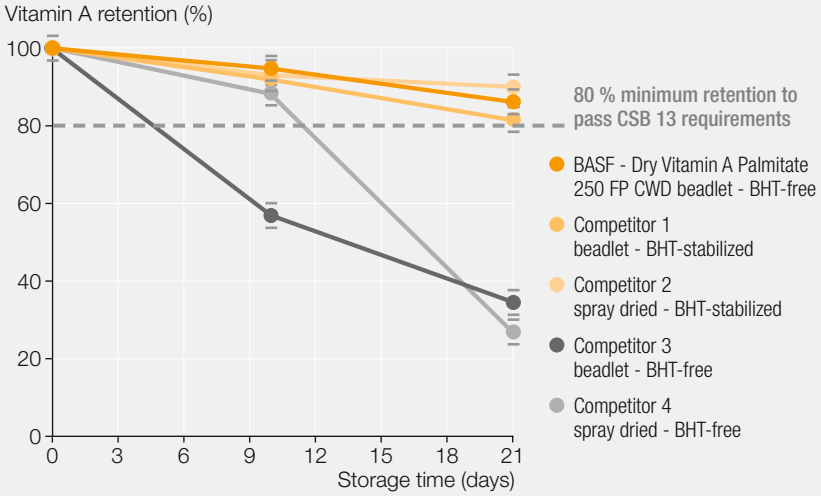



Figure: values are mean ± 3% SD (n=2). Wheat flour with 14% moisture was stored at 45 °C in a sealed container, according to USAID Commodities Requirements CSB 13. BASF study No. S-911 / S-868.

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