

FIXOLOR® AT IN SMOOTHIES

Handary
SHELF LIFE



KEY BENEFITS

- Growth control of aerobic bacteria;
- Increases Anthocyanin (color) stability;
- Increases Microbial stability;
- Cost effective;
- Shelf-life extension;
- Clean Label;

	Fixolor® AT
Code	0901
Registration Number	Clean Label
Organoleptic impact	Slightly Acidic
Source	Non-GMO, renewable
Thermal Stability	Up to 70°C
Applicable pH	3-6
Recommended dosage	0.5-1.0% (w/w)
Packing Size	1L, 20L
Appearance	Clear Brownish liquid
Labelling	Cultured Sugarcane
Solubility	Water Miscible

NATURAL ANTIMICROBIAL AND COLOR STABILIZER IN SMOOTHIES

Smoothies are susceptible to rapid microbial growth and instant colour change due to oxidation. Generally, chemical preservatives have been used as a way to prolong the shelf life of this category of beverages but the market is showing an increasing demand for change. Consumer preferences are driving manufacturers to opt for all-natural ingredients they can trust, with a focus on labelling, which has become a crucial tool for product recognition and selection, bringing clean and consumer-friendly label options to the forefront.

At Handary, we have developed Fixolor® AT, an all-natural product capable of extending the shelf life of smoothies, among other foods. This product is made from naturally cultivated sugar cane fermented using the *Lactobacillus* sp. bacterial strain. It is used to extend the shelf life of beverages by increasing the stability of anthocyanin (colour) and providing multiple barriers against spoilage bacteria. Fixolor® AT has been widely accepted as a clean alternative to synthetic preservatives, thus meeting consumer demands for friendly labelling.

The efficiency of Fixolor® AT in fruit smoothies has been shown to effectively inhibit the growth of spoilage bacteria during the shelf life of fruit based smoothies, maintaining an acceptable colour with maximum freshness and sensory characteristics.

OUR BRANDS

FIXOLOR® AT
Cultured Sugarcane



CASE STUDIES

Food spoilage is an issue for manufacturers, retailers and consumers due to health concerns. Fruit smoothies are made from fresh fruit what makes them susceptible to oxidation. Their main intrinsic factors are high water activity and an acidic pH (6-7) that favours the growth of aerobic bacteria giving a shelf life of 2 days if well conserved.

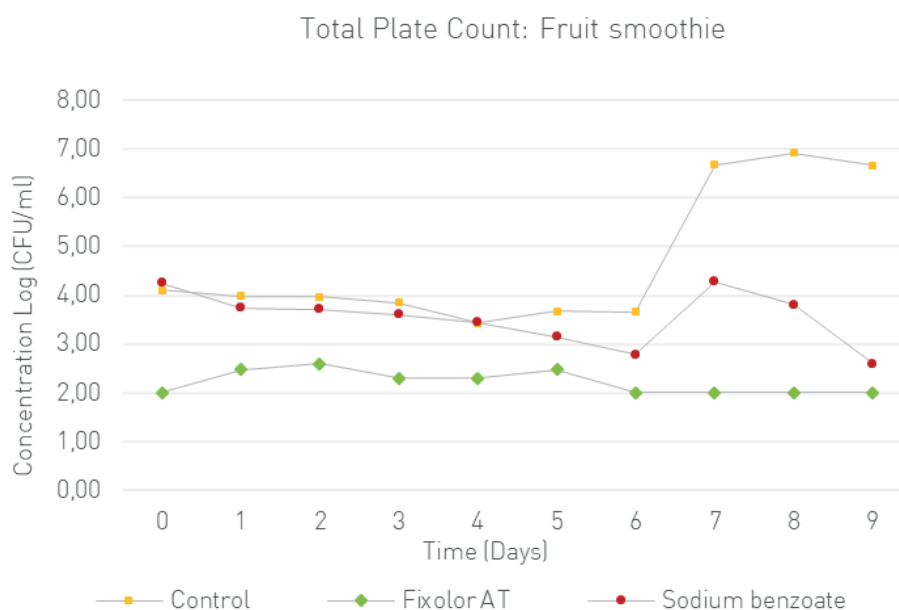
The shelf life of fruit smoothies is mainly limited by anthocyanins, which cause the colour of the product to fade in a short period of time. In addition, spoilage bacteria, such as *Alicyclobacillus* spp. cause unpleasant tastes and odours, gases and other signs of visual damage.

FIXOLOR® AT: FRUIT SMOOTHIES

To verify the antimicrobial effect of Handary Fixolor® AT, we mimicked the production of natural fruit smoothies in our laboratory, thus simulating the production carried out in the industry. In the first sample, 1% w/w Fixolor® AT was added. In the second sample, 0.1% w/w Sodium benzoate was added. Finally, in the third sample, no preservative was added, characterised as a control.

The graphs below show the results of total plate counts in the fruit smoothie. The study compares the difference in the microbial load of the fruit smoothie between control and treated samples (1% w/w Fixolor® AT and 0.1% w/w Sodium benzoate) at 4°C in the refrigerator.

The control sample took 7 days to reach a CFU of log 7, which is a threshold level that usually determines the end of shelf life due to bad odour, bad taste, visual defects and microbial overload. On the other hand, the sample treated with Fixolor® AT clearly indicates a shelf life of more than 9 days with clearly acceptable levels of Total Plate Count. The study carried out visually shows that the product maintains an acceptable visual standard even on day 14 of analysis.



CONCLUSION

Although plant-based beverages are susceptible to rapid spoilage and discolouration, it is important to understand how we can help extend their shelf life in an all-natural way by understanding and properly addressing the mycobacterial safety of these products.

This study shows how Handary's Fixolor® AT is an effective natural solution for increasing bacterial stability and extending the shelf life of fruit smoothies, while helping to maintain product colour with completely clean labelling.



APPLICATION GUIDELINE

The following guideline will assist you to get the optimum solution by using Handary Fixolor® AT fermented cultured sugar-cane to effectively and naturally extend the microbial and color stability and the shelf-life of fruit smoothies.

DIRECT ADDITION INTO FORMULATION

Follow the suggested dosages to apply Fixolor® AT directly into fruit smoothies.

Ingredients	Application		Benefits	Dosage
Fixolor® AT	Beverages	Fruit Smoothies	Growth control of bacteria, yeasts and molds and increase color stability	0.5-1.0% (w/w)

The recommended doses of Fixolor® AT are added after the fruit blending and mixing it properly with the product formulation. Dosages ranging between 0.5 and 1% of Fixolor® AT are added for every kilo of the final product.

FRUIT SMOOTHIES MANUFACTURING PROCESS

Follow the representative production process flow chart of smoothies and the recommended stage of product incorporation to get the best efficiency for Fixolor® AT application.

