Natural color solutions for beverages

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FROM NATURE TO YOU
Natural colors in Beverages: What are the expectations?

Stop the use of artificial colors?
No impact on product profile

Need stable solutions?
Color formulations optimized for high stability

Interested in Clean & Clear labelling?
Natural Ingredients, Organic

- Appearance: Clear/cloudy?
- Taste: no off flavor

- No Fading (heat process, light/heat/oxidation during storage)
- No Ring
- No ingredient interaction

- Regulatory constraints
- Clean label (ingredients/additives within the color formulation)
Yellow beverages: Alternative to FD&C Yellow No. 5

- Yellow 5: 0.0015% powder
- Curcumin: 0.02% Not light stable
- Lutein: 0.02% Not permitted in the US
- Carotenes: 0.015% More golden shade
Yellow beverages: Alternative to FD&C Yellow No. 5

- **More golden than Yellow 5,**
- **Cloudy or clear depending on formulation/dosage**
- **Good stability but sensitive to oxidation.**

Yellow 5
0.0015% powder

Carotenoids
More golden shade
Natural Carotenes, a clean label solution?

Natural source of pigment…

Fermentation from Blakeslea trispora

Natural source of emulsifiers…

Emulsifier/process

Aqueous Phase

Oil dispersible

Water dispersible

Natural source of antioxidants…

Oil Phase
Natural Carotenes with enhanced stability

Carnosic acid

Phenolic compound with antioxidant properties

Addition of natural antioxidants

Color stability during storage (accelerated light trial)

Time Hrs in UV box

Minolta dE00 Value

4 6 8 10 12 14 16 18

0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00

Color shade

Addition of natural antioxidants

Food & Beverage

Rosemary (Rosmarinus officinalis L.)
Enhance color stability in application

- Use stabilized carotene emulsions
- Rosemary extract can be added in finished drink
- Vitamin C – Standard recommendation
  200-300ppm Vit C to enhance carotenoids stability to light
Safflower extract: A future alternative to Yellow No. 5?

- **Yellow 5**
  - 0.0015% powder

- **Safflower** (Carthamus extract)
  - Naturally water soluble
  - Excellent light and heat stability
  - No off-flavor at low levels
  - Not currently permitted in the US, petition ongoing.

- Curcumin
  - Not light stable

- Lutein
  - Not permitted in the US

- Carotene
Orange beverages: Alternative to FD&C Yellow No. 6

- Paprika
  - Stabilized with natural antioxidants
  - Emulsified with Gum arabic
  - Deodorized Paprika
  - Organic compliant

- Alternative Beta carotene and Vegetable extract
Red beverages: Large spectrum of color shades

From yellow red to purple red...

Anthocyanins are the main pigments used in the world to replace red 40 dye in beverages.

Various Fruits and vegetables extracts sources are available and they all deliver their reddest shade at low pH.

An increase in pH will change the hue to red/blue depending on the sources of anthocyanins.
Red Beverages and stability of natural options

The stability varies depending on the source of the pigment and the formulation

- Stability varies depending on the source
- Vegetables sources are more stable than fruit sources
- Some customized blends offer enhanced stability vs single pigments
- Organic version also available for some sources
Natural color in beverages: how to meet the challenges?

How to further improve the stability during storage:

- De-araetion of water recommended
- Filling after flushing with Nitrogen for cold filling
- Optimize color dosage
- Protective packaging (UV barrier, sleeve)
- Shelf life trials
- Addition of ascorbic acid and Rosemary extract for carotenoids
- Choose most stable color formulation with optimum antioxidant level
• **Innovate** together to multiply creativity and technical expertise
• **Improve** time-to-market through co-creation with natural ingredients you can trust
• **Adapt** our solutions to local markets through our regional locations

**CULINARY**: Provide culinary-based applications made with all natural ingredients offering unique visual, taste and texture appeal

**FORMULATION**: offer solutions to your specific formulation challenges

**CONCEPTS AND PROTOTYPES**
With rapid time-to-market

**SCALED UP SOLUTIONS**
and assistance with process development
Our core categories of natural ingredients

- COLORS
- ANTIOXIDANTS
- SPECIALTY F&V
- PHYTOACTIVES
FROM NATURE TO YOU

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