



# Avela<sup>TM</sup>

Natural (R)-1,3 Butanediol

## FORMULATION GUIDE

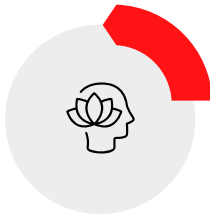
**More Endurance • More Mental Clarity • More Energy**

Avela™ natural (R)-1,3-butanediol is a functional ingredient that provides a new way for consumers to experience the benefits of ketosis, of increased endurance, mental clarity, and sustained energy on demand.

## Benefits



Sugar-free, stimulant-free sustained energy



On-demand mental clarity and endurance.



Plant-based and sustainable

## Guidelines for Avela™ Use

Avela™ GRAS guidelines indicate a serving size of 11.5 grams up to three times daily, totaling 34.5 grams per day. However, for formulating, as little as 5-10 grams of Avela per serving can yield significant benefits. Avela is approved for the general population (people aged two and older) for use in beverages, caffeinated beverages, bars and gels.

## How to use Avela™ Sample Kit

For first time Avela users interested in an easy, accessible formulation, we recommend mixing an Avela serving (<11.5g) with water and the water enhancer drops (included in the sample kit) to encourage seeing how easy it is to formulate with Avela.

Ingredient	Mio Lemonade Avela Drink (12 oz)*	Stur Strawberry Watermelon Naturally Sweetened Drink (12 oz)
Water	323.50	315.50
Water Enhancer Drops	5.00	13.00
<b>Avela™ (R)-1,3-Butanediol</b>	11.50	11.50
Total	340.00	340.00

\*Typically included in Avela sample kits

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# Suggested Flavor Maskers to use with Avela™ (R)-1,3 Butanediol

Avela can have a bitter taste when tasted neat or in formulations that do not account for its strong flavor. However, some common commercial flavor maskers will neutralize the characteristic, bitter Avela flavor, creating a foundation for formulating a variety of product types.

- **Sensient Smoothenol® Flavor Modulator** types modulate any bitter flavors beverage applications with a serving size of 8 oz or more. These two flavor modulators are suggested for use together and in equal parts.

Ingredient	Ingredient Code	Use Rate
<b>Sensient Smoothenol® 2G 3129 Natural</b>	■ SN2000038951	■ 0.10-0.20%
<b>Sensient Smoothenol® Natural</b>	■ SN3000002956	■ 0.10-0.20%

→ [More Information](#)

<https://sensientflavorsandextracts.com/smoothenol/>

- **Clear IQ™ by Myco Technology** is a powerful bitter blocker that works to significantly diminish Avela characteristic, bitter flavor in 8 oz or less beverages, shot applications, bars and gels.

Ingredient	Ingredient Code	Use Rate
<b>Clear IQ™ natural flavor</b>	■ C100 Absolute Flavor	■ 10-50 ppm

→ [More Information](#)

<https://www.mycoiq.com/ingredients/cleariq>

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# Avela™ Sample Formulations

Designed to be a starting point for your own innovations, Geno scientists have created highly functional and thoughtfully flavored applications using Avela.

## Avela™ Pineapple Mango Selzer

<i>Ingredient</i>	<i>%</i>
Water	95.98
<b>Avela™ (R)-1,3-Butanediol</b>	<b>3.28</b>
Reb M	0.05
Sensient Smoothenol® Sweet Modifier	0.07
Sensient Smoothenol® 2G 3129 Modifier	0.07
Citric Acid	0.20
Malic Acid	0.10
Natural Pineapple Flavor	0.15
Natural Mango Flavor	0.10
<b>Total</b>	<b>100.00</b>

## Avela™ Lemonade Electrolyte Sports Drink

<i>Ingredient</i>	<i>%</i>
Water	95.69
<b>Avela™ (R)-1,3-Butanediol</b>	<b>3.23</b>
Citric Acid	0.34
Malic Acid	0.09
Sucralose	0.02
Acesulfame-K	0.01
Natural Lemonade Flavor	0.30
Sensient Smoothenol® Modifier	0.10
Sensient Smoothenol® 3129 Modifier	0.10
Sea Salt	0.06
Potassium Sorbate	0.03
Sodium Benzoate	0.03
<b>Total</b>	<b>100.00</b>

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# Orange Hydration Beverage

Ingredient	Percent (w/w)	Function
Filtered Water	96.37	Base solvent
<b>Avela™ (R)-1,3-Butanediol</b>	<b>2.43</b>	Functional ingredient; increased mental clarity and athletic endurance
Potassium Citrate	0.275	Electrolyte; supports hydration and muscle function; pH buffer
Magnesium Citrate	0.058	Electrolyte; supports muscle function
Morton® Select Sea Salt	0.053	Sodium source; hydration + electrolyte balance
Niacinamide (Vitamin B3)	0.003	Energy metabolism and cellular health
Pyridoxine Hydrochloride (Vitamin B6)	0.0004	Aids in metabolism and neurotransmission
Cyanocobalamin (Vitamin B12)	0.000005	Energy production and red blood cell formation
Ascorbic Acid (Vitamin C)	0.019	Antioxidant; immune health; preservation
Potassium Sorbate	0.030	Preservation
Sodium Benzoate	0.030	Preservation
Sucralose	0.022	Non-nutritive sweetener
Citric Acid Anhydrous	0.370	pH adjuster, flavor enhancer; preservation
Natural Orange Flavor WONF	0.300	Natural flavoring
ClearIQ™ A500	0.037	Flavor enhancer/modifier
<b>Total:</b>	<b>100.00</b>	



## BATCHING INSTRUCTIONS

(instructions are general and may vary for commercial scale production):

1. Add in potassium sorbate until fully incorporated.
2. Add in sodium benzoate until fully incorporated.
3. Add in remaining ingredients one by one until fully incorporated.
4. Fill according to product specification.

**Allergen:** None

**Ingredients:** Filtered Water, Avela™ ((R)-1,3-Butanediol), Citric Acid, Natural Flavors, Potassium Citrate, Magnesium Citrate, Sea Salt, Potassium Sorbate, Sodium Benzoate, Sucralose, Vitamin C (Ascorbic Acid), Niacinamide (Vitamin B3), Pyridoxine Hydrochloride (Vitamin B6), Cyanocobalamin (Vitamin B12)

## Nutrition Facts

Serving size	16 fl oz (473mL)
Amount per serving	
<b>Calories</b>	<b>100</b>
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 120mg	5%
Total Carbohydrate 1g	0%
Dietary Fiber 0g	0%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0.3mg	2%
Potassium 500mg	10%
Vitamin C 90mg	100%
Niacin 16mg	100%
Vitamin B <sub>6</sub> 1.7mg	100%
Vitamin B <sub>12</sub> 2.4mcg	100%
Magnesium 40mg	10%

\*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

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# Ready-to-Drink Coffee Beverage

Ingredient	Percent (w/w)	Function
Filtered Water	90.50	Base solvent; hydrates and carries other ingredients
Avela™ (R)-1,3-Butanediol	3.24	Functional ingredient; increased mental clarity and athletic endurance
Potassium Sorbate	0.030	Preservation
Sodium Benzoate	0.03	Preservation
Sucralose	0.01	Non-nutritive sweetener
ClearIQ™ A500	0.04	Flavor enhancer/modifier
Natural Cold Brew Coffee Concentrate #36071	6.000	Flavor base; coffee flavor and caffeine
All Natural Vanilla Flavor WONF #34033	0.150	Natural flavoring; smooth vanilla notes
Total	100.00	

- BATCHING INSTRUCTIONS**  
(instructions are general and may vary for commercial scale production):
1. Add in potassium sorbate until fully incorporated.
  2. Add in sodium benzoate until fully incorporated.
  3. Add in remaining ingredients one by one until fully incorporated.
  4. Fill according to product specification.

**Allergen:** None

**Ingredients:**

Filtered Water,  
Cold Brew Extract,  
Avela™ ((R)-1,3-Butanediol),  
Natural Flavors,  
Potassium Sorbate,  
Sodium Benzoate,  
Sucralose

Nutrition Facts	
Serving size	12 fl oz (355mL)
Amount per serving	
<b>Calories</b>	<b>100</b>
% Daily Value*	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 20mg	1%
Total Carbohydrate 0g	0%
Dietary Fiber 0g	0%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 30mg	0%
*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.	

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# Gin & Tonic Mocktail

Ingredient	Percent (w/w)	Function
Carbonated Filtered Water	95.78	Base and carbonation source
<b>Avela™ (R)-1,3-Butanediol</b>	<b>3.24</b>	Functional ingredient; increased mental clarity and athletic endurance
Potassium Sorbate	0.03	Preservation
Sodium Benzoate	0.03	Preservation
Natural Juniper Berry Flavor WONF	0.25	Natural flavoring; botanical, piney notes, mimicking the essence of gin or herbal mixers
Natural Quinine Flavor WONF	0.17	Flavoring; bitter tonic-like taste without using actual quinine
Natural Mixed Berry Type Flavor	0.20	Flavoring; fruity, sweet, and tart berry profile
Sucralose	0.02	Non-nutritive sweetener
Citric Acid Anhydrous	0.25	pH adjuster and flavor enhancer; adds tartness and helps preserve stability
ClearIQ™ A500	0.04	Flavor enhancer/modifier
<b>Total</b>	<b>100.00</b>	



## BATCHING INSTRUCTIONS

(instructions are general and may vary for commercial scale production):

1. Add in potassium sorbate until fully incorporated.
2. Add in sodium benzoate until fully incorporated.
3. Add in remaining ingredients one by one until fully incorporated.
4. Carbonate and fill according to product specification.

**Allergen:** None

### Ingredients:

Carbonated Filtered Water,  
Avela™ ((R)-1,3-Butanediol),  
Natural Flavors,  
Citric Acid,  
Potassium Sorbate,  
Sodium Benzoate,  
Sucralose

## Nutrition Facts

<b>Serving size</b>	<b>12 fl oz (355mL)</b>
<b>Amount per serving</b>	
<b>Calories</b>	<b>90</b>
	<b>% Daily Value*</b>
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 15mg	1%
Total Carbohydrate 1g	0%
Dietary Fiber 0g	0%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 0g	
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 30mg	0%

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# Avela Quick Facts:

- Metabolically preferred (R)-isomer
- Naturally made by fermentation of sugar
- 99.7% pure (R)-1,3-Butanediol
- FALCPA and common food allergen-free
- Vegan/vegetarian and plant-based
- Manufactured in a GMP facility in the United States
- Product Form:** Liquid
- Trade name:** Avela (R)-1,3 butanediol
- Chemical Name:** (R)-1,3 butanediol
- CAS Number:** 6290-03-5
- Max Daily Dose:** not more than 33.5g per day

Avela has been concluded to be generally recognized as safe ("self-GRAS") by a panel of independent, qualified scientists for use by the general population as a source of energy in beverages, bars and gels.

To learn more about Avela, request a sample or hear how it can help differentiate products and support label claims, contact Geno at [info@avelaup.com](mailto:info@avelaup.com) and visit <http://www.avelaup.com>.

## About geno.

Geno (Genomatica, Inc.) is harnessing biology to remake everyday products to be more sustainable and natural. Geno's technology, built over the last 20 years, now commercializes and scales sustainable alternatives to commonly used ingredients and materials across several industries including functional foods and beverages, beauty, apparel, automotive, home and personal care, and packaging. Geno is partnering with world-leading brands including Aquafil, Asahi Kasei, lululemon, Unilever, Kao and L'Oréal.

### Nutrition Facts

**Serving Size** 10g

**Amount per serving**

**Calories** 69

%Daily Value \*

**Total Fat** 0g 0%

Saturated Fat 0g 0%

Trans Fat 0g

**Cholesterol** 0mg 0%

**Sodium** 0mg 0%

**Total Carbohydrate** 0g 0%

Dietary Fiber 0g 0%

Total Sugars 0g 0%

Includes 0g Added Sugars

**Protein** 0g 0%

**Vitamin D** 0mcg 0%

**Calcium** 0mg 0%

**Iron** 0mg 0%

**Potassium** 0mg 0%

\*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

**INGREDIENTS:** (R)-1,3-BUTANEDIOL.

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