The Power of Polyphenols

Polyphenols and the Gut: Mechanisms, Microbial Interactions & Clinical Relevance

HASKAPA

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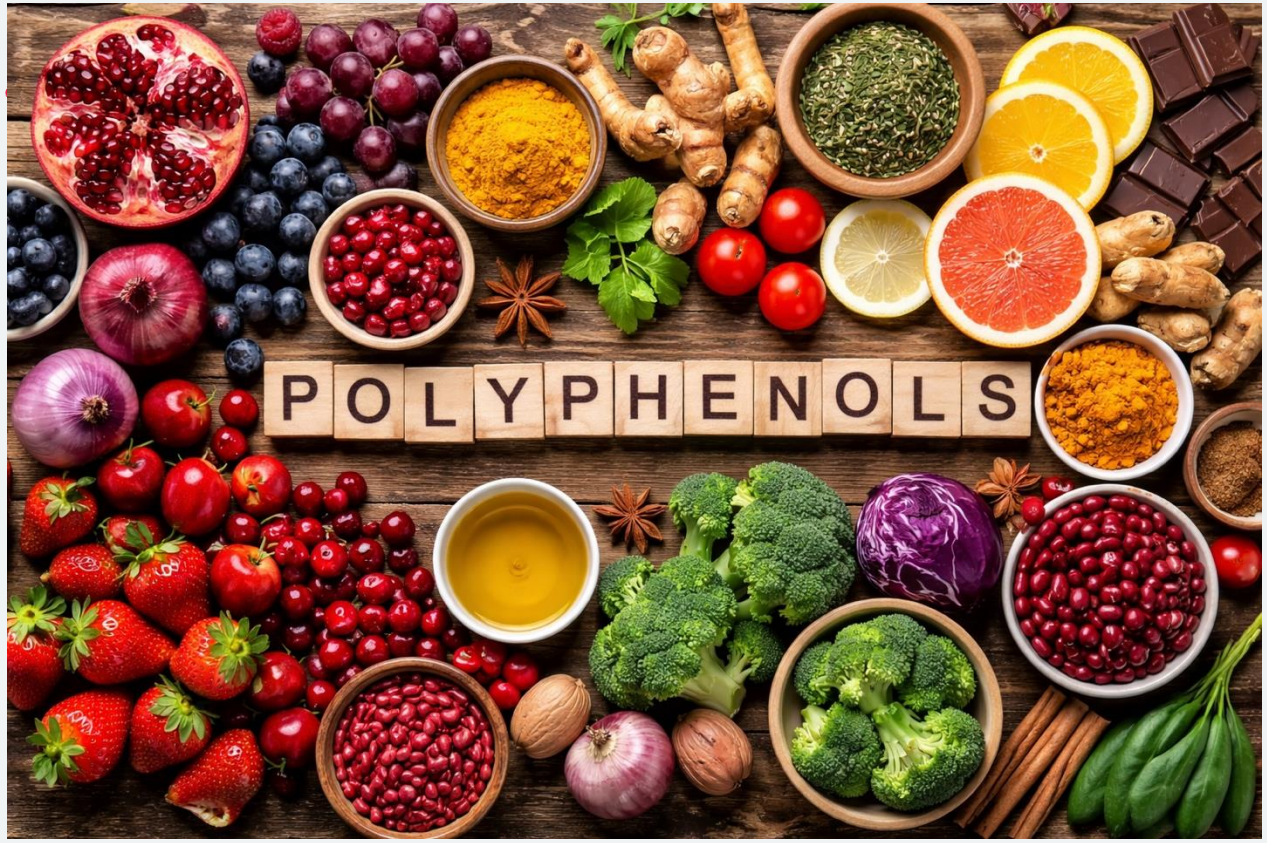
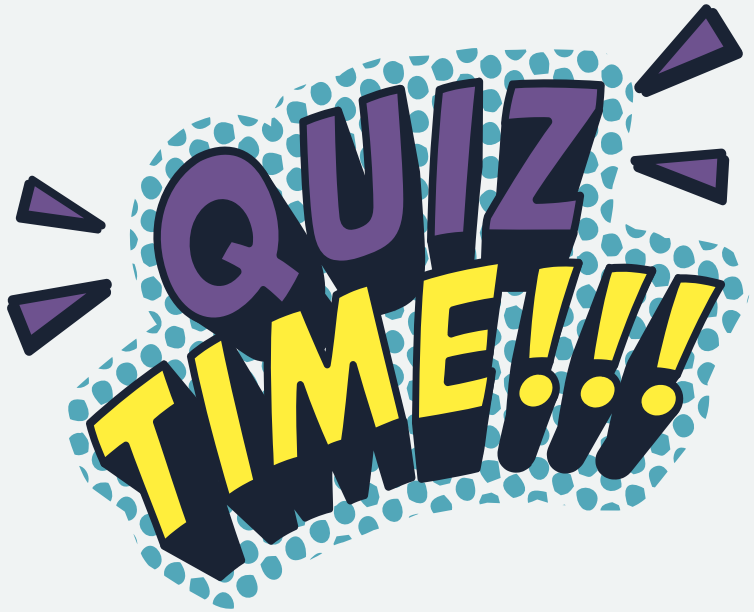
- Registered Nutritional Therapist DipION mBANT CNHC
- Head of Nutrition and Corporate Wellness Facilitator - 10 years
- Private practice in Hampshire offering talks, courses & 1-2-1
- Love delicious, simple, effective ways to support family and clients with functional foods

The rainbow on your plate is not just beautiful - it's medicinal. Each colour represents different polyphenols working to protect your cells, reduce inflammation, and promote longevity.



- Polyphenol overview
- Mechanisms
- Study examples
- Polyphenol influencers
- Haskap berry example
- Questions



How many different types of polyphenols are there (that we know about)?

a). Over 2,000 types

b). Over 4,000 types

c). Over 8,000 types

Which food has the highest polyphenol content (mg per 100g)?

a). Black elderberry

b). Clove

c). Cocoa powder

Which is the most well studied polyphenol?

a). Resveratrol

b). Anthocyanin

c). EGCG

Plant Polyphenols

The Low Down

- **Flavonoids** - the largest class with over 6,000 compounds
- **Phenolic Acids –** abundant in coffee, tea and cinnamon
- **Stillbenes** – resveratrol:
- one of the most well known
- **Lignans** – found in seeds, wholegrains and some vegetables

Plant Polyphenols: A Complex Matrix

The Low Down

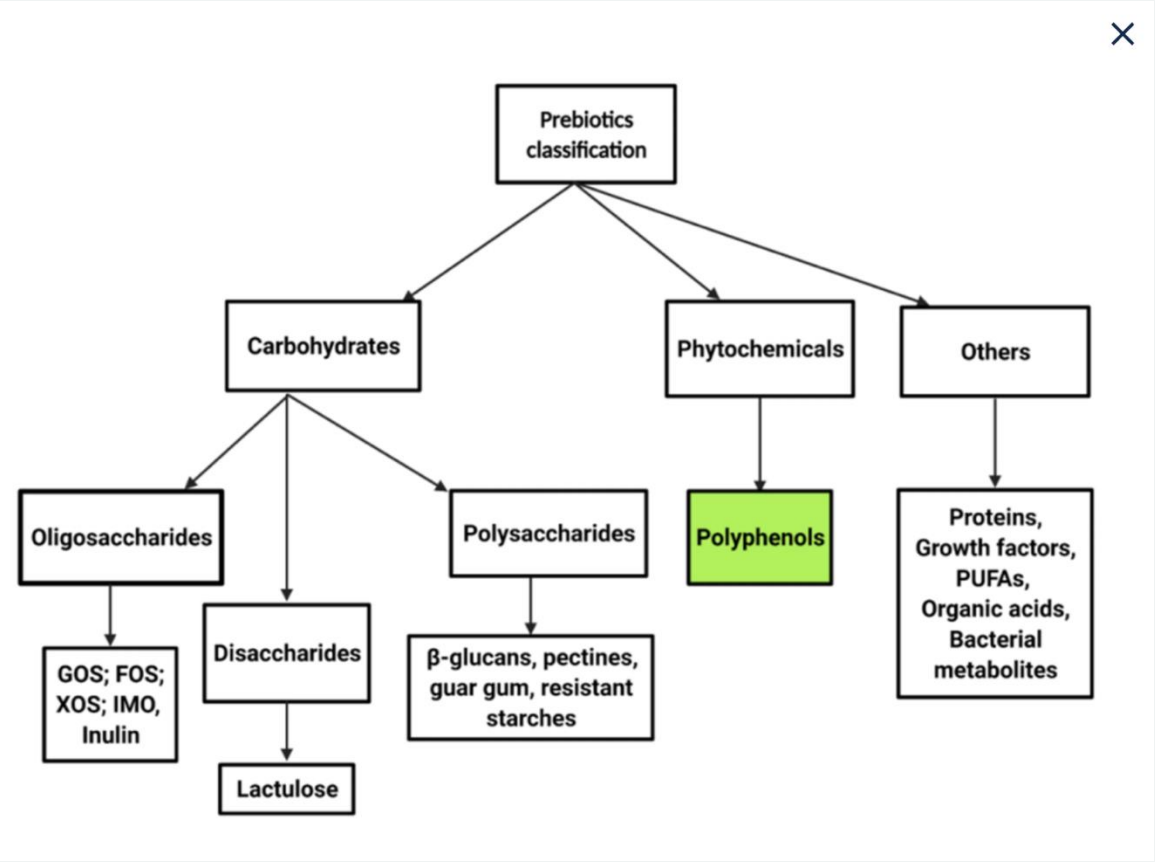
Polyphenols as prebiotics

Polyphenols as prebiotics

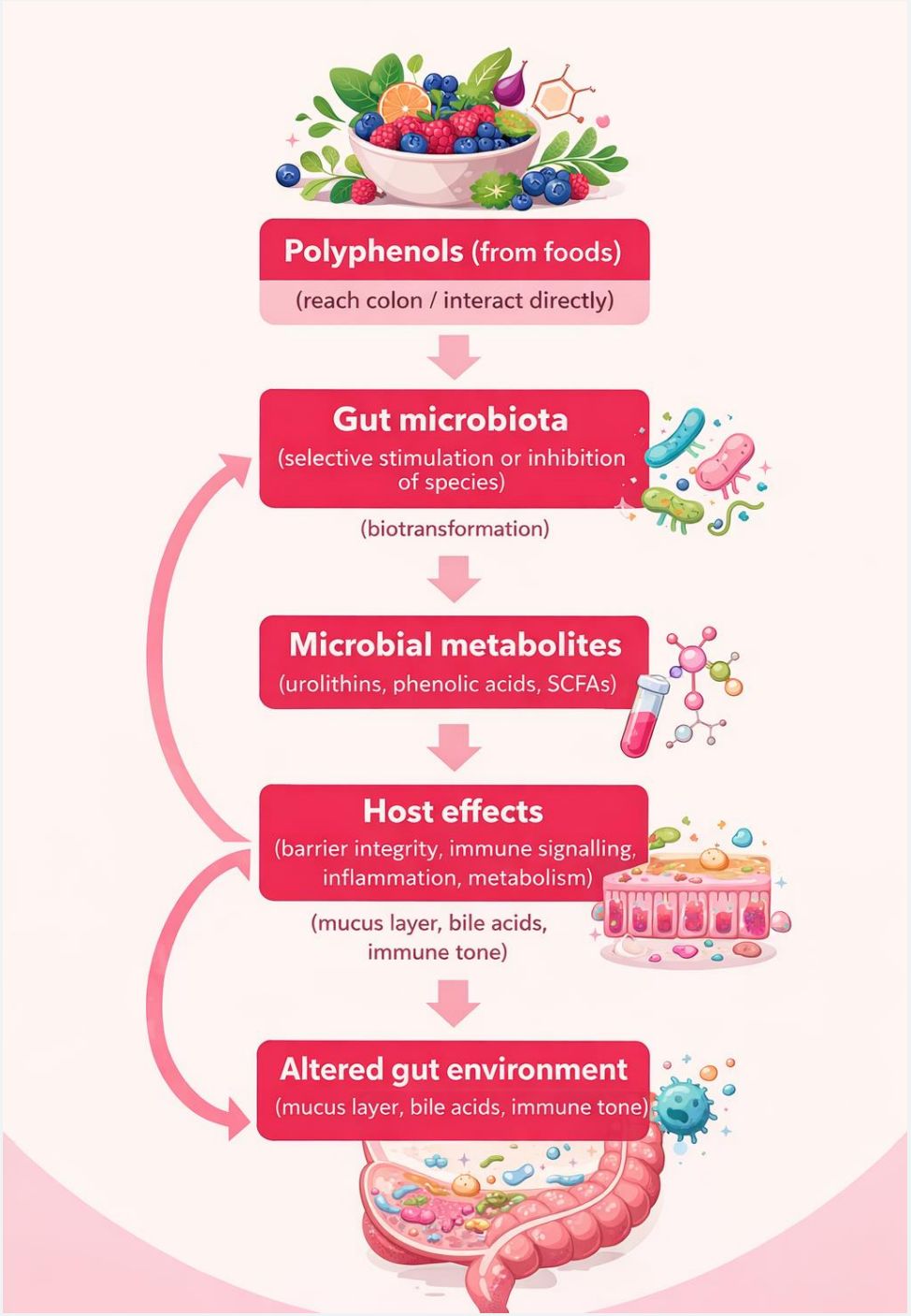
Prebiotic - “a substrate that is selectively utilised by host microorganisms conferring a health benefit”

- Most polyphenols escape upper-GI digestion and reach the colon
- Some are hydrolysed and absorbed earlier
- Colonic microbes ferment remaining compounds
- Fermentation supports beneficial microbial taxa
- Microbes determine downstream health effects

Polyphenols as prebiotics



Polyphenols and the gut form a dynamic, bidirectional system mediated by microbial metabolism and host responses.



Key mechanisms linking polyphenols & digestive health

- ✓ Survival to the colon and interaction with the gut microbiota
- ✓ Microbial biotransformation into bioactive metabolites
- ✓ Production of short-chain fatty acids (SCFAs)
- ✓ Strengthening of gut barrier function via tight-junction regulation
- ✓ Modulation of immune and inflammatory signalling *(e.g., NF-κB, Nrf2)*
- ✓ Potential reductions in endotoxin (LPS) burden via microbiome shifts and barrier support
- ✓ Alteration of bile acid metabolism and host signalling pathways

Polyphenols and clinical gut studies

- **Pomegranate extract**
- *Punicalagin-enriched supplement taken over 4 weeks*
  - ➢ Microbiome shifts specifically in genera and species
  - ➢ Increase in circulating SCFAs
  - ➢ Higher urolithin A

- **Walnuts**
- *33g peeled walnuts over 3 days*
  - ➢ Impacted microbiome despite short trial time
  - ➢ Modulated SCFAs in some individuals
  - ➢ Altered urolithin A – depending on individual differences

Polyphenols and gut studies - reviews

- **Green tea - various studies different outcomes**
  - Matcha green tea for two weeks – significantly altered fecal microbiota in humans
  - Systematic reviews on tea show variability in outcomes
  - Depends on dose, form and individual host factors
- **Extra virgin olive oil – mainly positive studies**
  - EVOO polyphenols modulate gut microbiota composition, with some studies reporting increases in health-associated taxa
  - Multiple bioactives working in synergy to support gut health
  - May increase SCFA production

Anthocyanins and gut health mechanisms

- Low absorption in the small intestine – **delivered largely intact to the colon** where they interact with microbes
- **Broken down into smaller phenolic acids** to become more biologically active
- Studies report increases **in Bifidobacterium and Akkermansia** plus **enhanced Firmicutes/Bacteroides ratios**
- Metabolites have been shown to **increase SCFA production**
- Other research shows their support **for gut barrier, immune, and metabolic signalling**
- **Anti-inflammatory and antioxidant** effects widely recognised

Distinct subclasses – distinct microbial metabolites

Anthocyanins → **phenolic acids** → barrier + immune effects

Flavanols → **valerolactones** → metabolic + inflammatory signalling

Ellagitannins → **urolithins** → barrier + responder phenotypes

Flavonols / phenolic acids → **smaller aromatics** → bile acid + immune modulation

What influences polyphenol effects?

- **Food matrix and processing**
  - Surrounding nutrients, processing methods and liquid v whole-food formats may produce different metabolic responses.

- **Food–food interactions**
  - Endgenous enzymes eg. banana enzymes
  - Full fat V low fat

What influences polyphenol effects?

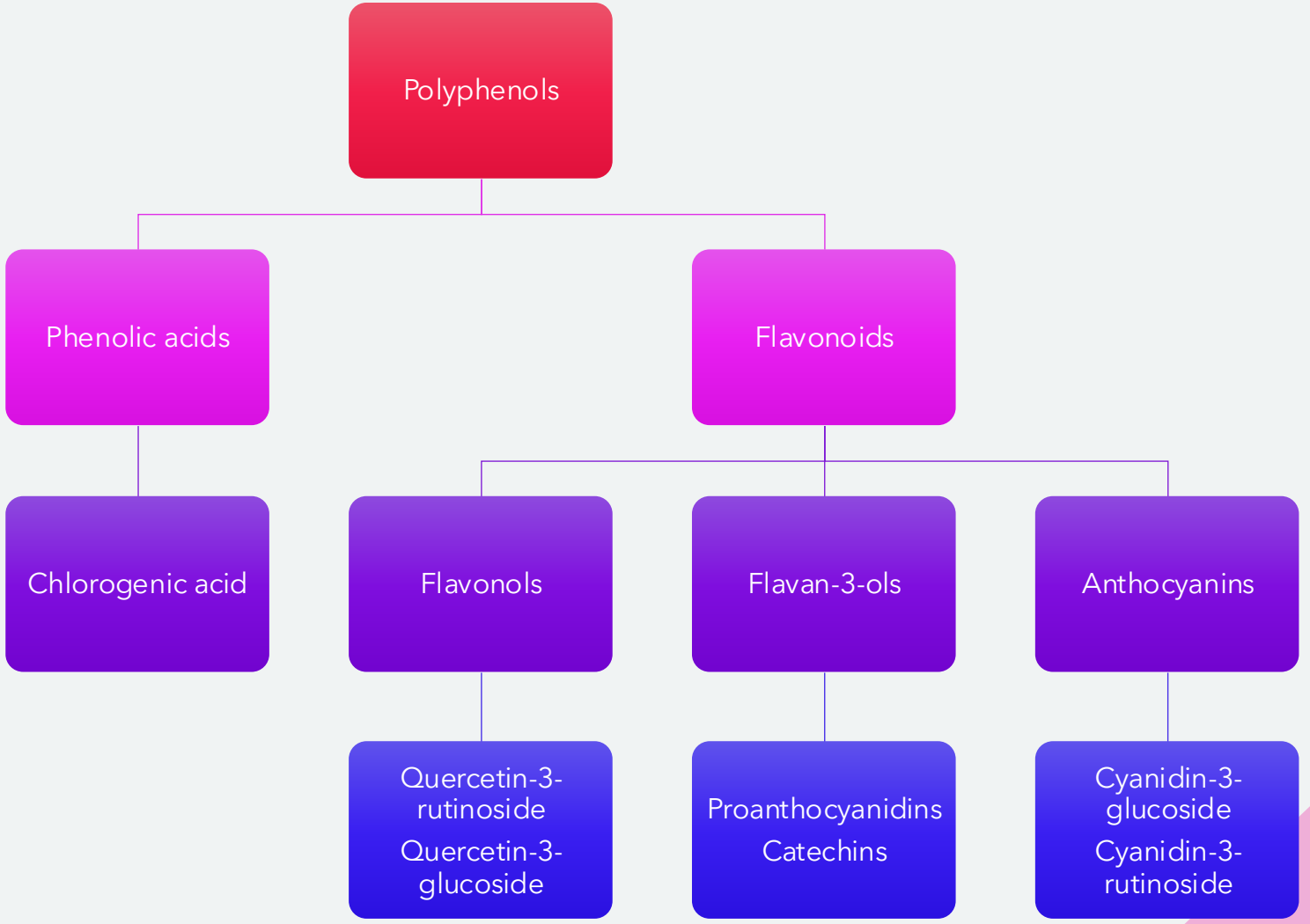
- **Baseline microbiota (“responders vs non-responders”)**
  - ➢ People with different gut microbial functions produce distinct polyphenol metabolites
- **Dose and duration**
  - ➢ Short exposures may not change microbiota significantly
- **Polyphenol subclasses**
  - ➢ Different polyphenol subclasses have distinct bacterial metabolic pathways.

Key Learnings

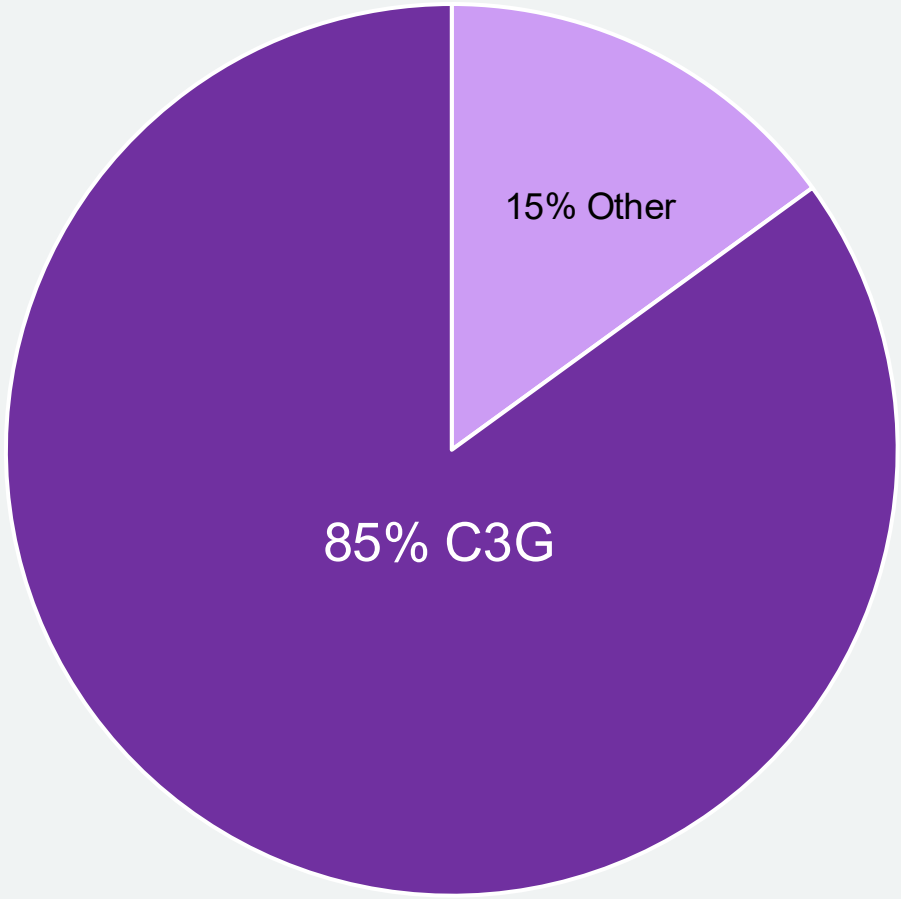
- **Colour diversity remains important for gut health –** and benefits extend beyond fibre alone
- **Outcomes are not limited to changes in microbial taxa; microbial metabolites are often the key mediators**
- **Optimise polyphenol delivery where possible and minimise adverse interactions** (e.g., frozen berries, grinding coffee beans, fermented foods; avoid combining berries with banana in smoothies)
- **Inter-individual variability is substantial** – what works for one person may not work for another
- **The science of polyphenols and gut health is rapidly evolving**

Anthocyanin Example: Haskap Berry

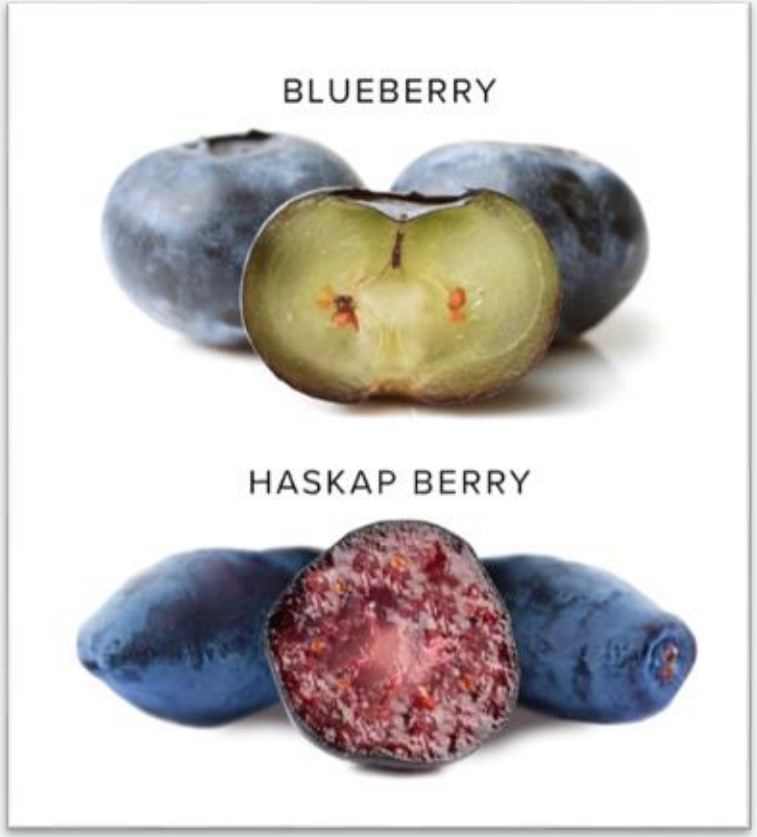
Polyphenol Profile of Haskap Berry



Haskap Berry Anthocyanin Profile



What is a haskap berry? *Lonicera caerulea*



- Edible blue honeysuckle
- Long lived shrub
- Elongated blueberry
- 3 x more antioxidants and 4 x more anthocyanins than a blueberry

HASKAPA

Products & Uses

- Freeze-dried 100% Haskap Berry Powder
- Organic freeze-dried Haskap Berry Powder
- Organic Haskap Berry Juice
- Organic Haskap Berry & Ginger Juice

Purchase at www.haskapa.com or The Natural Dispensary, Amrita or Your Health Basket

Affiliate scheme - 20% off for clients & 15% back to you!

For science or any other information please contact: Julie@haskapa.com

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