



**Plant & Food  
Research**  
Rangahau Ahumāra Kai

# New consumer products made from apples, cherries, apricots, peaches and nectarines

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**BPA 2210 Evaluation of bio-resources from Central Otago**

**December 2022, SPTS #23287**

The New Zealand Institute for Plant and Food Research Limited





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# Introduction and the purpose of this report



- This report contributes to the wider project being managed by the Central Otago District Council “Understanding fruit loss in Central Otago”. More details on that project can be found here: <https://www.codc.govt.nz/services/economic-development/fruit-loss>
- The aim of this report is to review the current international market to determine what types of potential value-added products are being made from the by-products of apple, cherry, apricot, peach, and nectarine (ACAPN) fresh fruit production. For a selection of different products, typical processes and unit operations are described.
- There are two main sections in this report
  1. New Product Launches
  2. Product concepts and processes



# **New Product Launches**

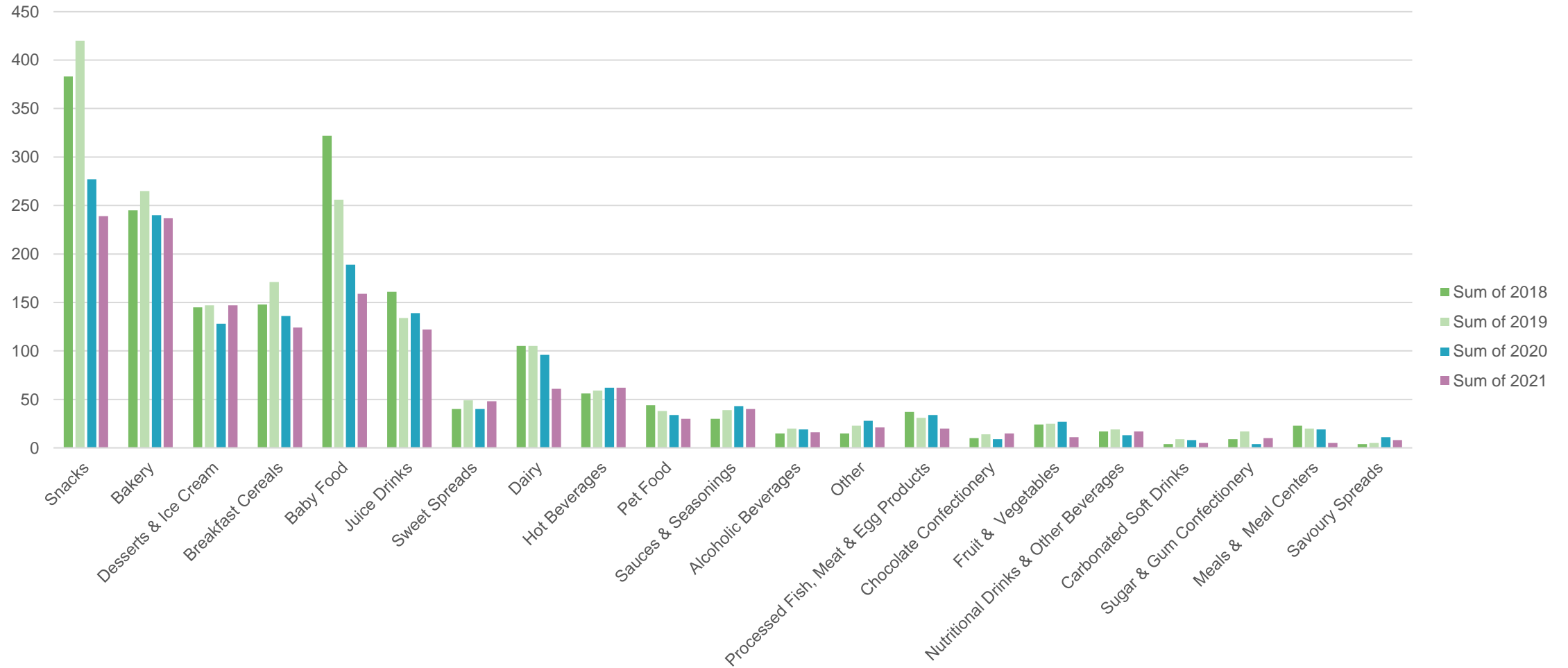
# New product launches



- This section includes a series of graphs showing new product launches of food, beverage, nutraceutical and healthcare products that have been released to global markets between 2018 and 2021.
- A trend across most categories is an apparent decrease in the number of launches. This could be attributed to COVID-19. During the pandemic, new product development activities reduced and the supermarket trade may have limited the introduction and launch of new products. This is evident in the data presented on fruit products here.
- The fruit content of each product may vary considerably, and will include products that contain large concentrations of fruit (e.g. fruit juice) and products that contain a relatively low fruit content (e.g. fruit fragrances in personal care products)
- The data shown are not absolute (i.e., they do not cover every product launched in every market), but the information can still be useful for comparison purposes, and can be helpful to drive business strategy about where to target launches:
  - what categories are on the rise/falling
  - where is there competition
  - what areas are ripe for development for B2B ingredient opportunities.
- All data in this section were kindly provided from Mintel Group Limited (<https://www.mintel.com/>) and reinterpreted by Plant & Food Research.

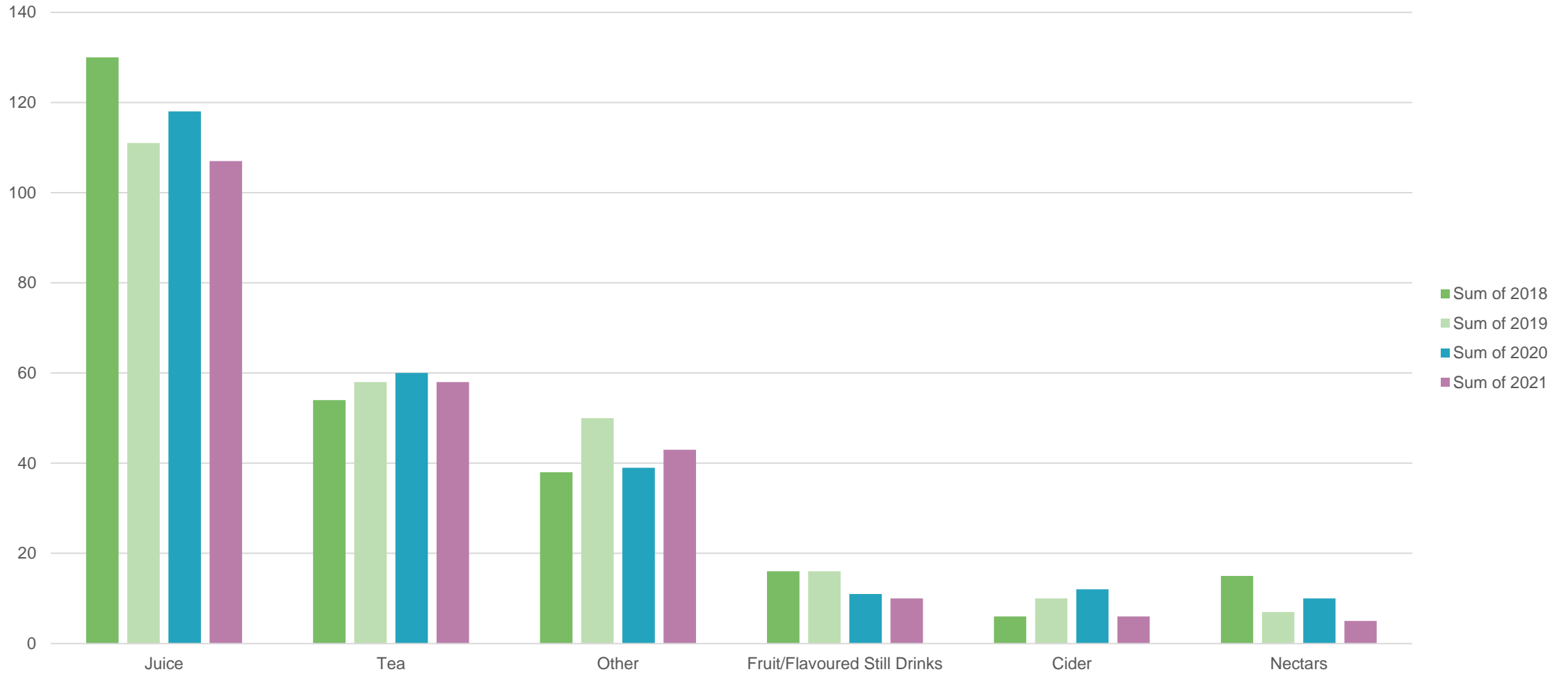


## Apple products with apple (food) in the ingredients launched, by subcategory (New Product Launches 2018–2021)



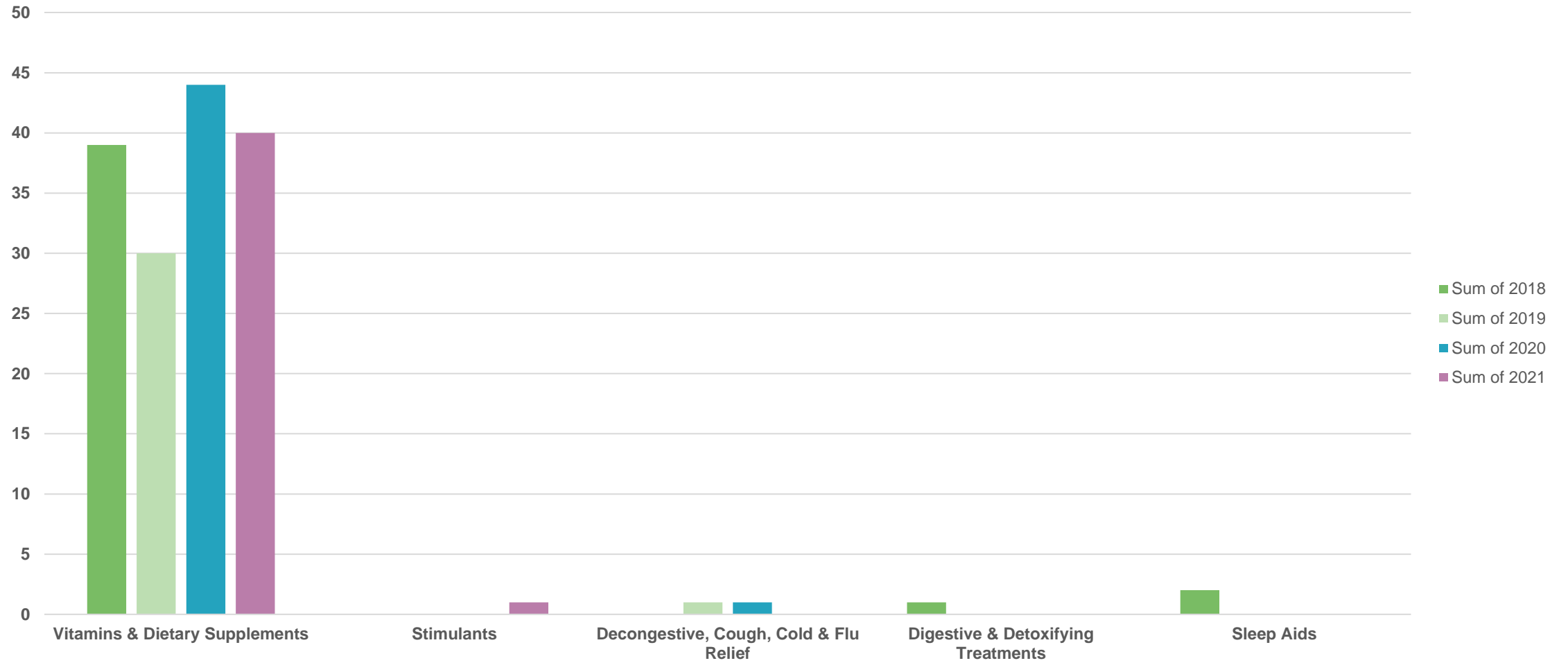


### Apple beverages with apple (food) in the ingredients launched, by subcategory (New Product Launches 2018–2021)





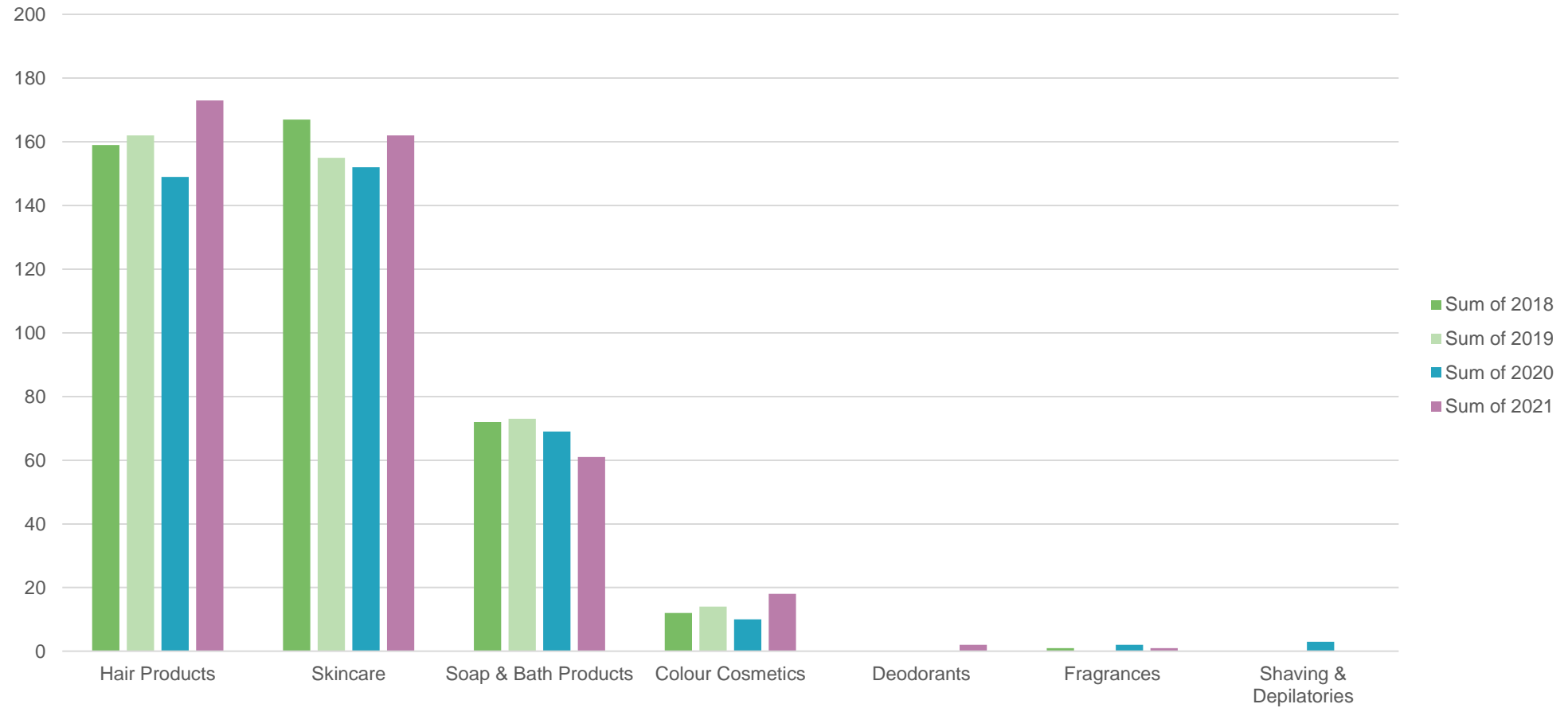
## Healthcare products with apple (food) in the ingredients launched, by sub-category (New Product Launches 2018–2021)





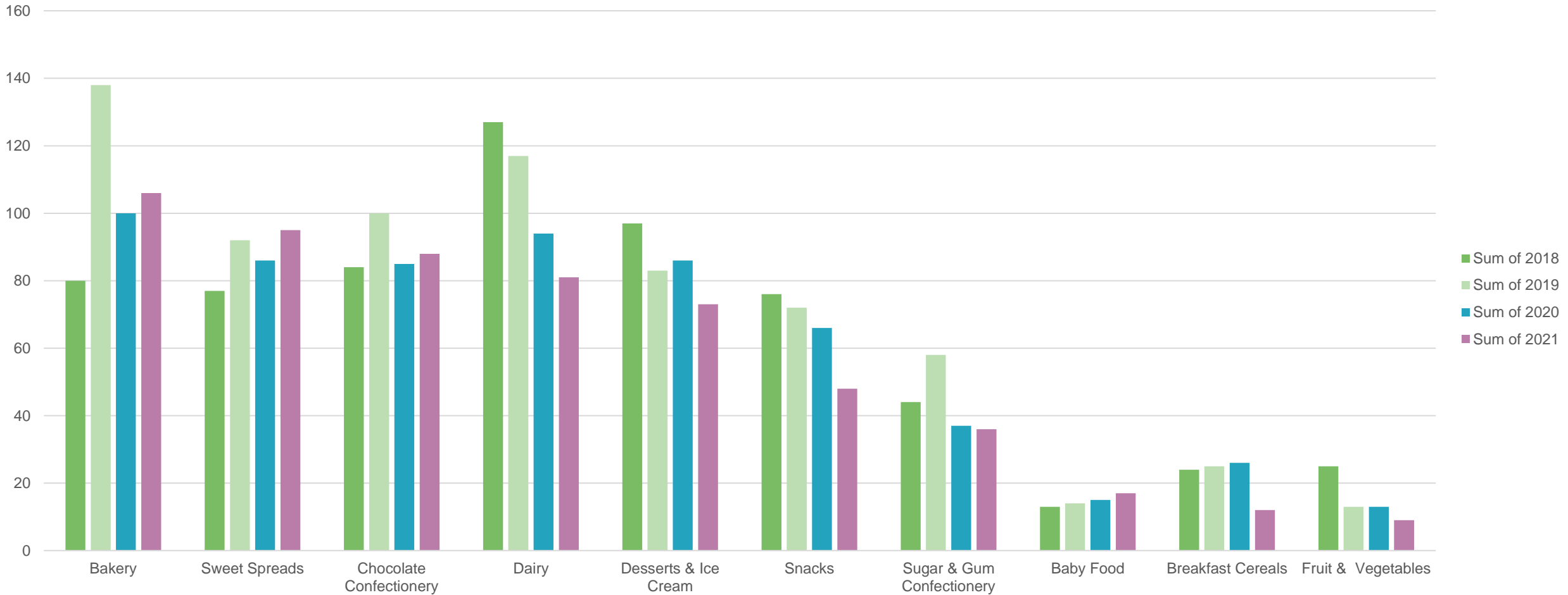


## Beauty and personal care products with apple mentioned in the product description and with apple-based ingredients launched, by category (New Product Launches 2018–2021)



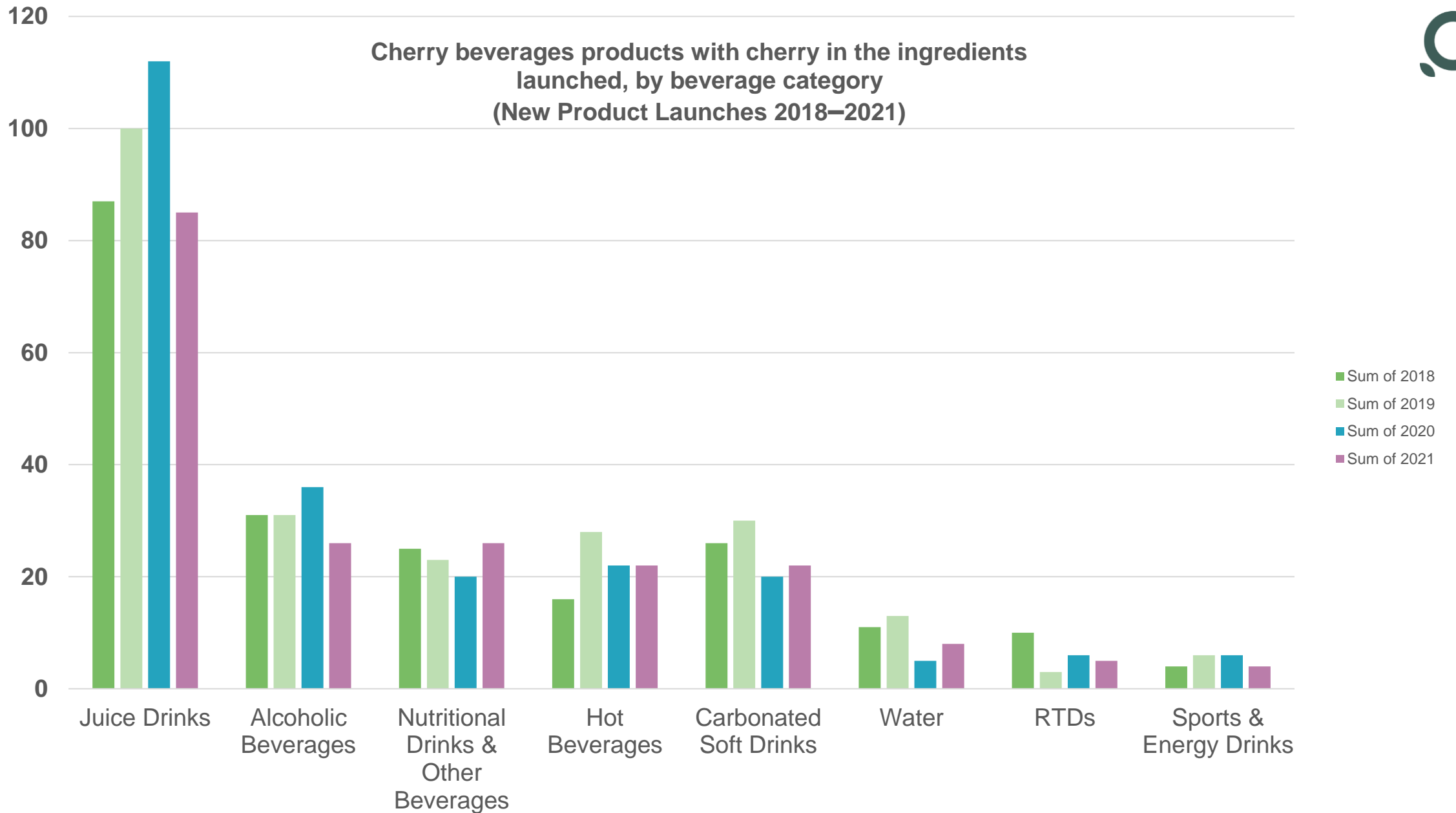


## Cherry food products with cherry in the ingredients launched, by food category (New Product Launches 2018–2021)



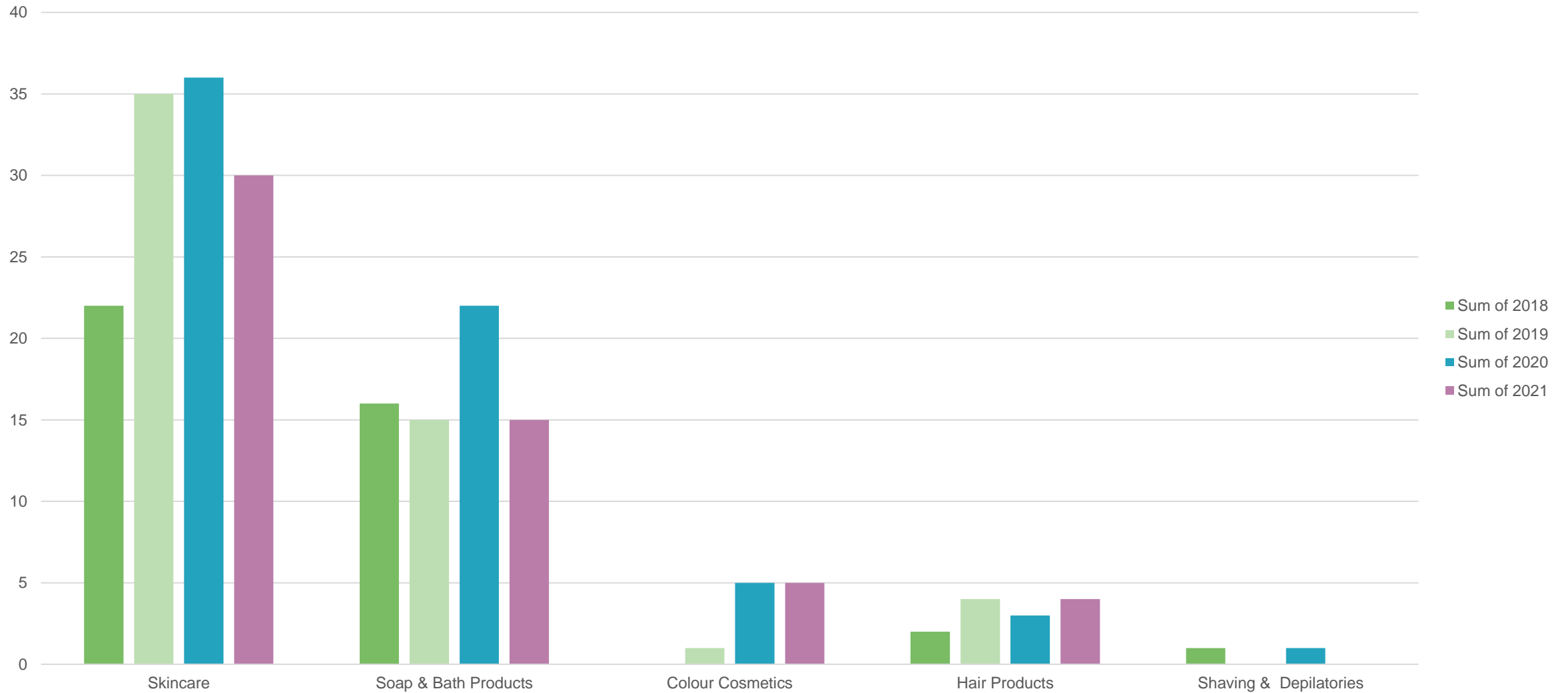


### Cherry beverages products with cherry in the ingredients launched, by beverage category (New Product Launches 2018–2021)

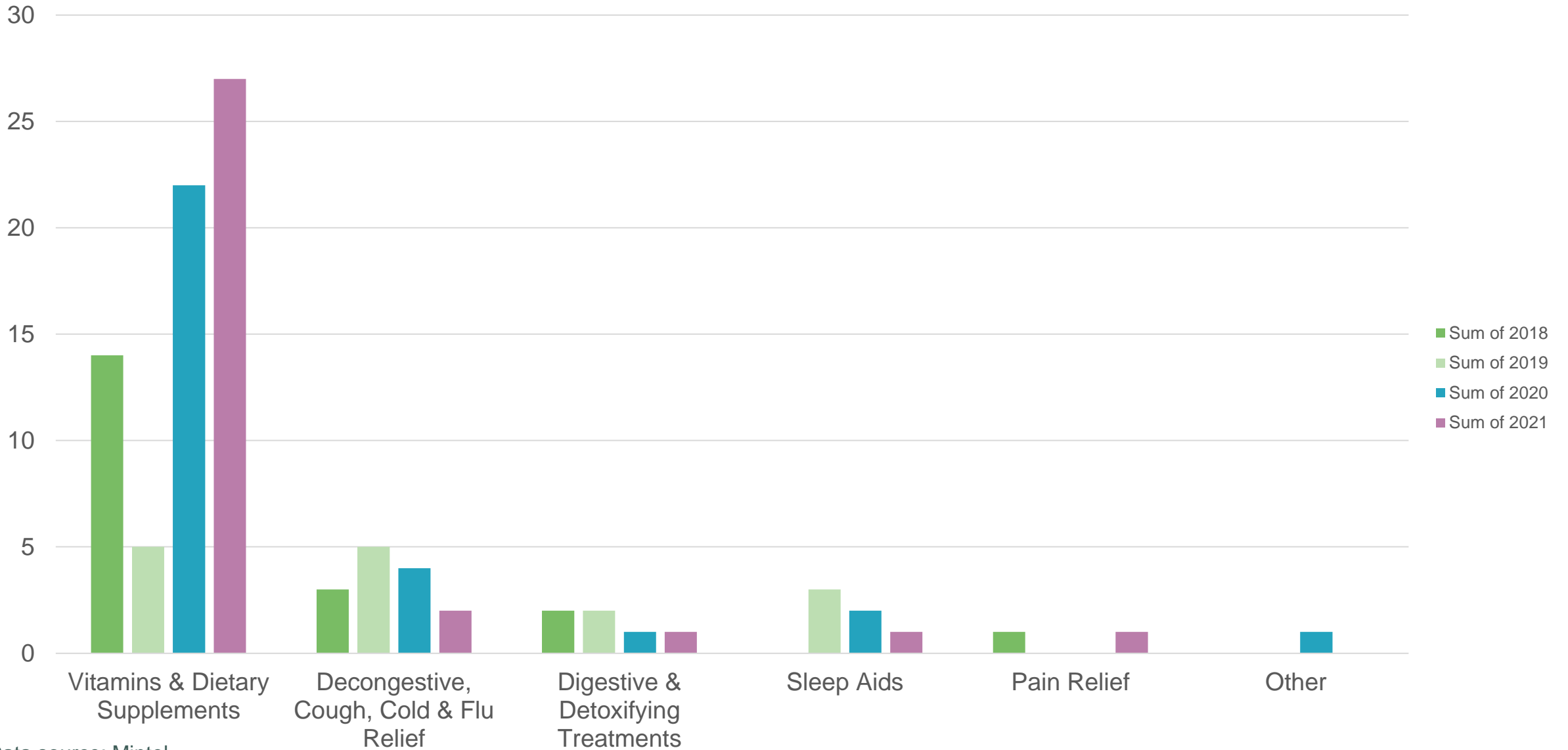




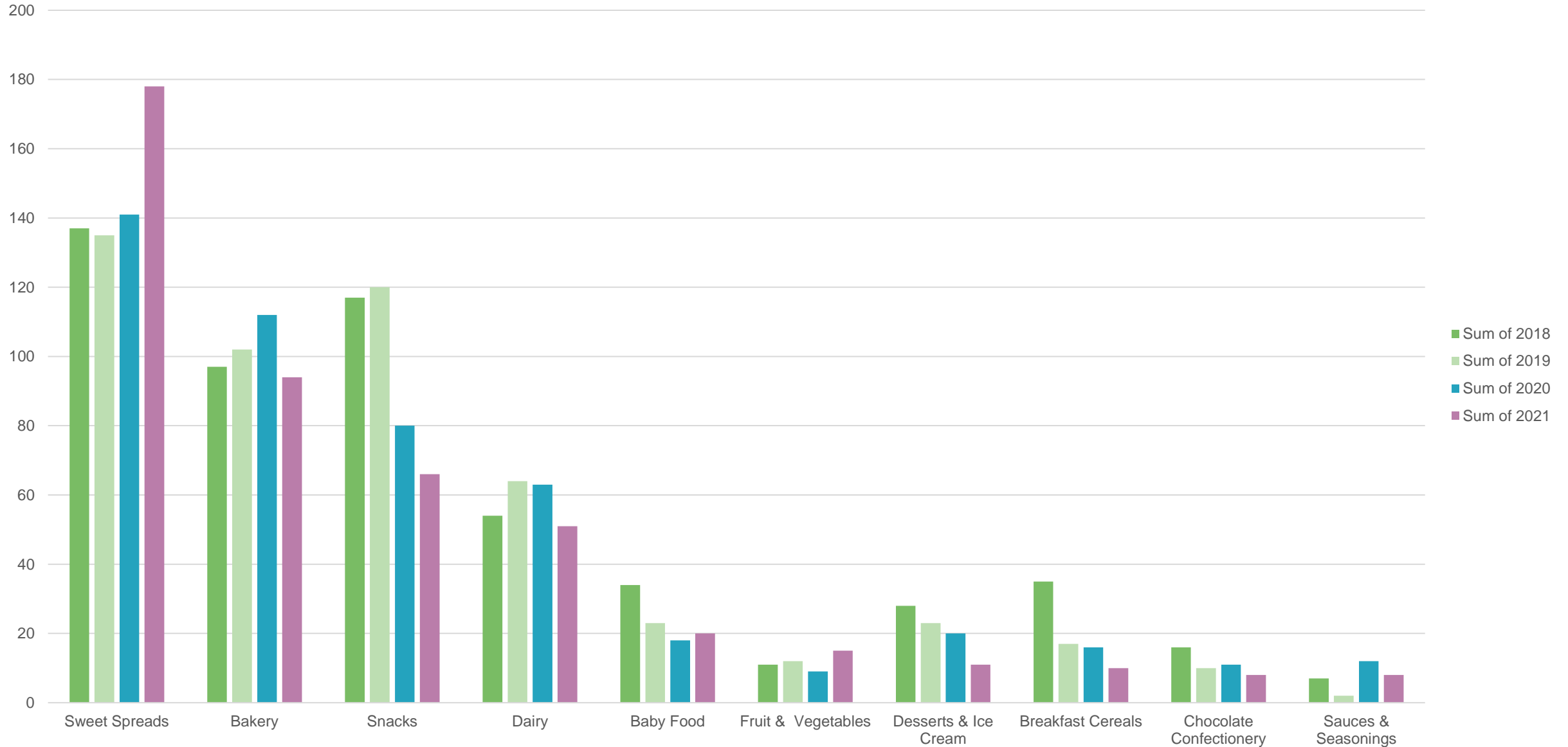
## Cherry beauty and personal care products with cherry in the ingredients launched by beauty and personal care category (2018 - September, 20221)



Cherry healthcare products with cherry in the ingredients  
launched, by healthcare sub-category  
(New Products Launched 2018–2021)

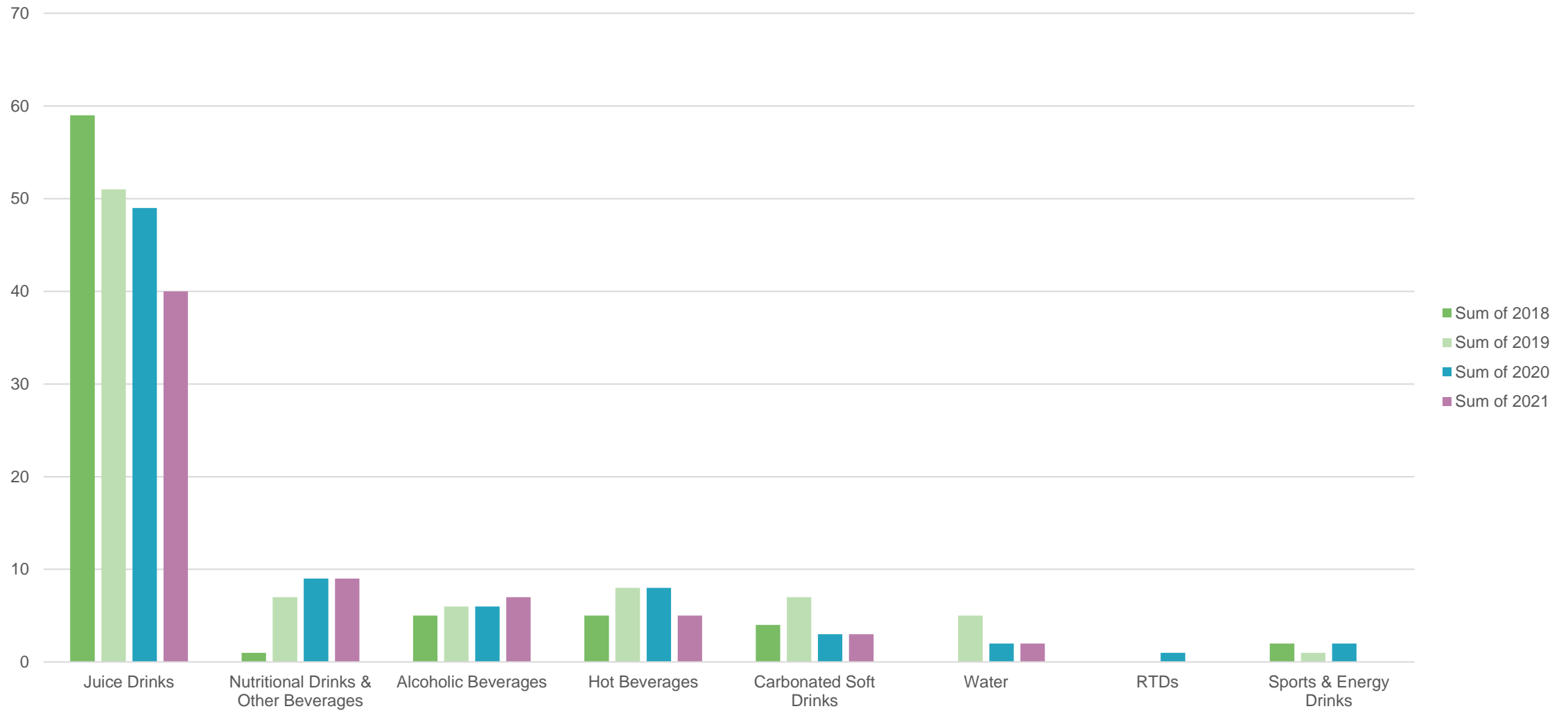


# Apricot food products with apricot in the ingredients launched, by food category (New Products Launched 2018–2021)

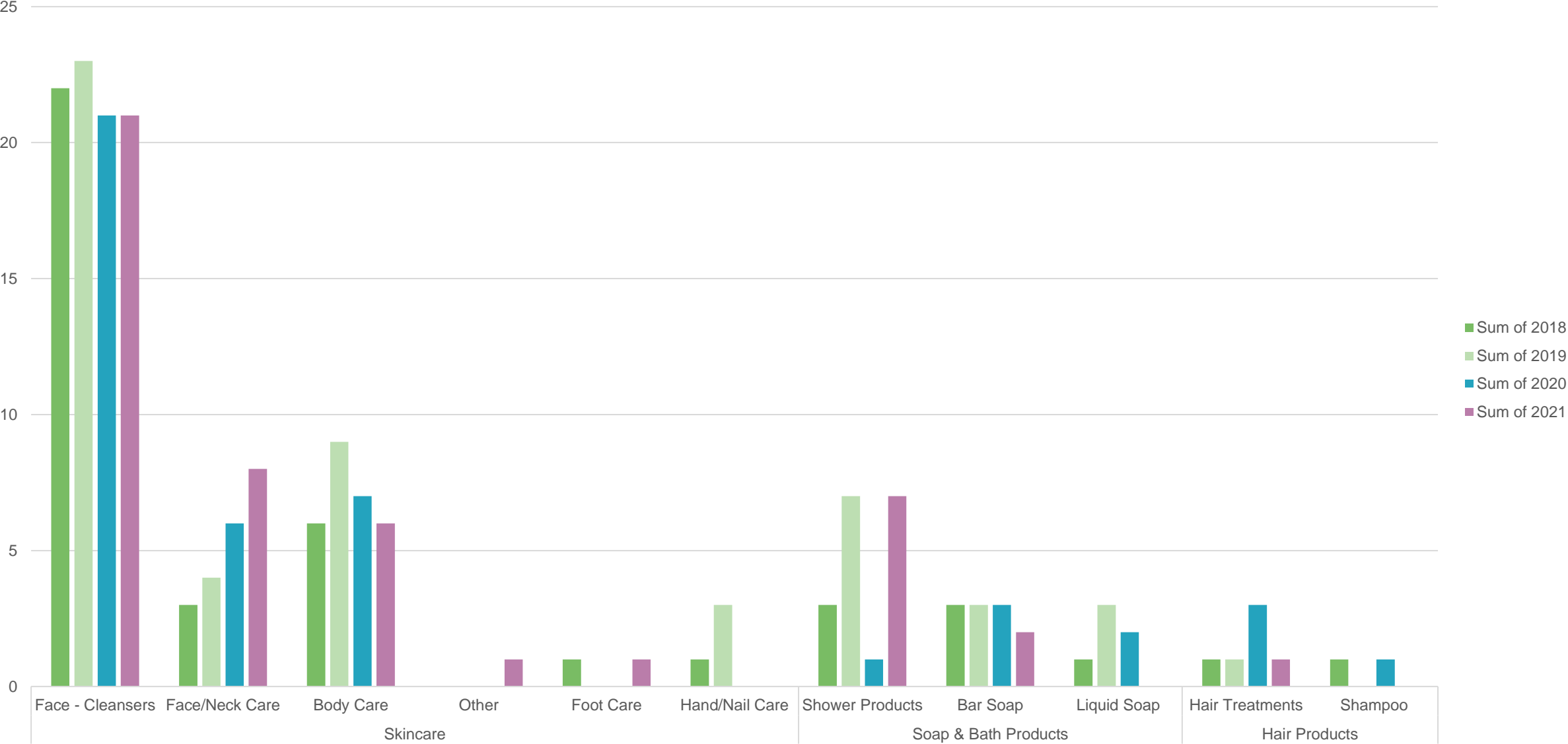




## Apricot beverage products with apricot in the ingredients launched by beverage category (2018 - September, 2021)



# Apricot beauty and personal care products with apricot in the ingredients launched, by beauty and personal category and sub-category (New Products Launched 2018–2021)

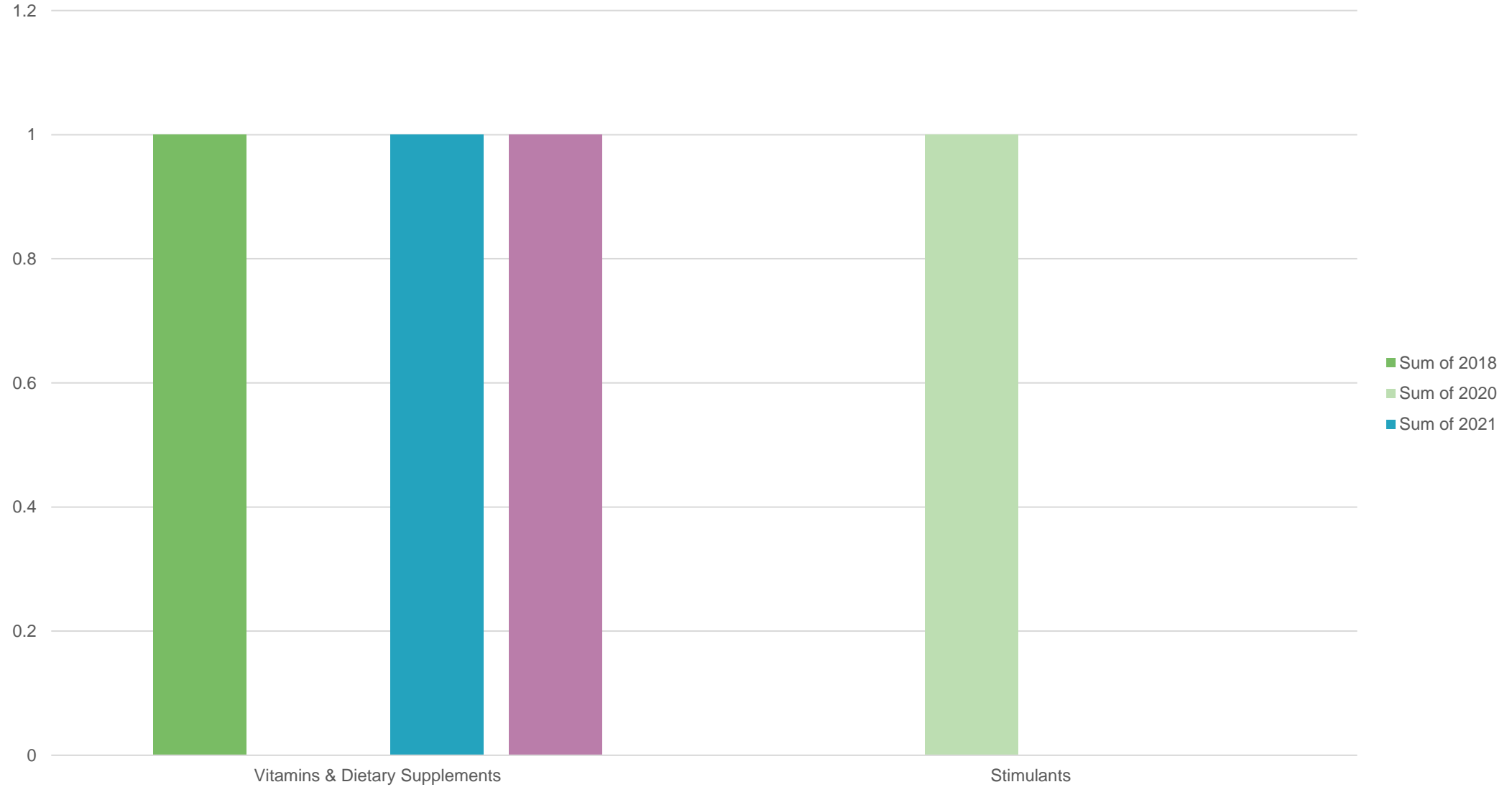


Data source: Mintel, September 2022

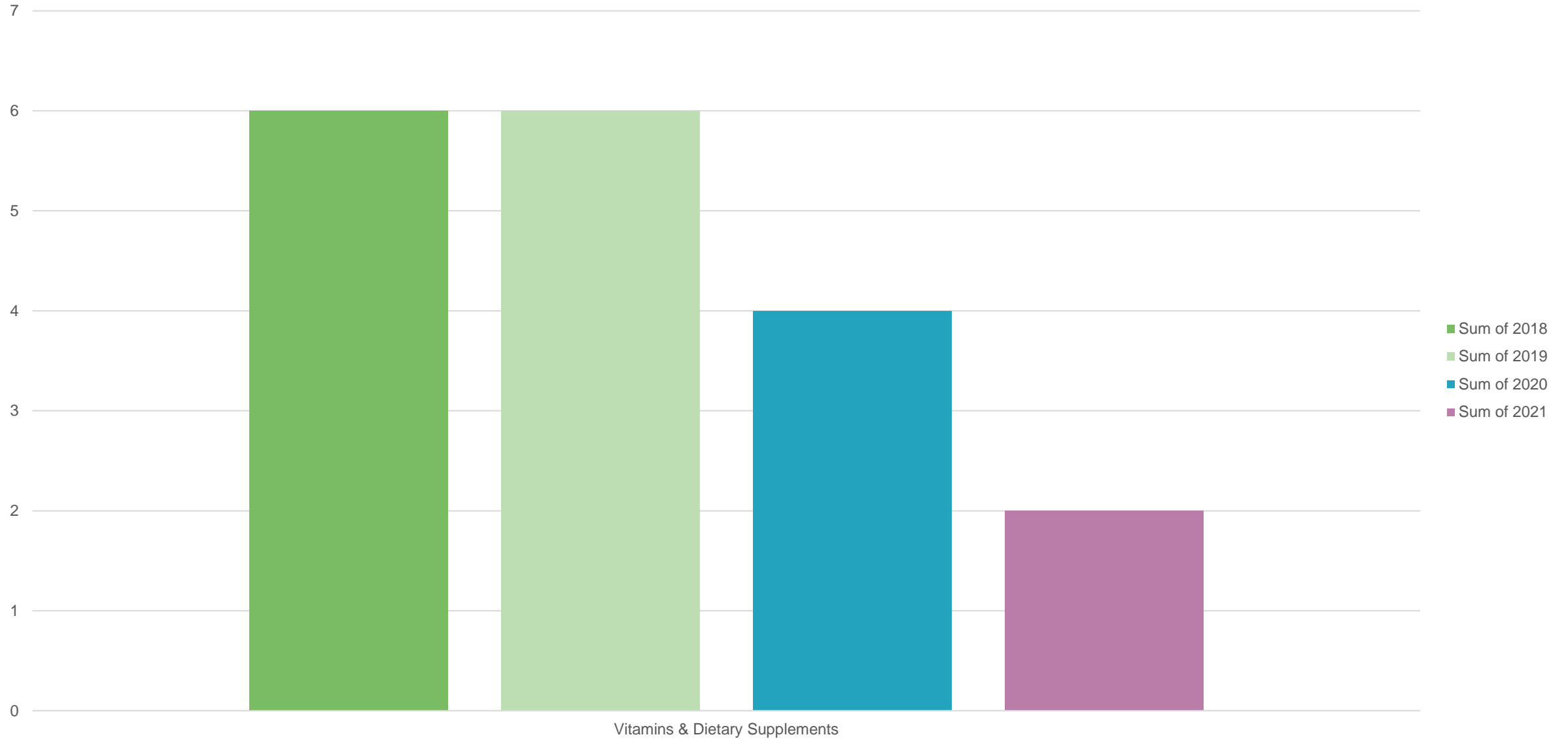




## Apricot health and hygiene care products with apricot in the ingredients launched, by health and hygiene sub-category (New Products Launched 2018–2021)

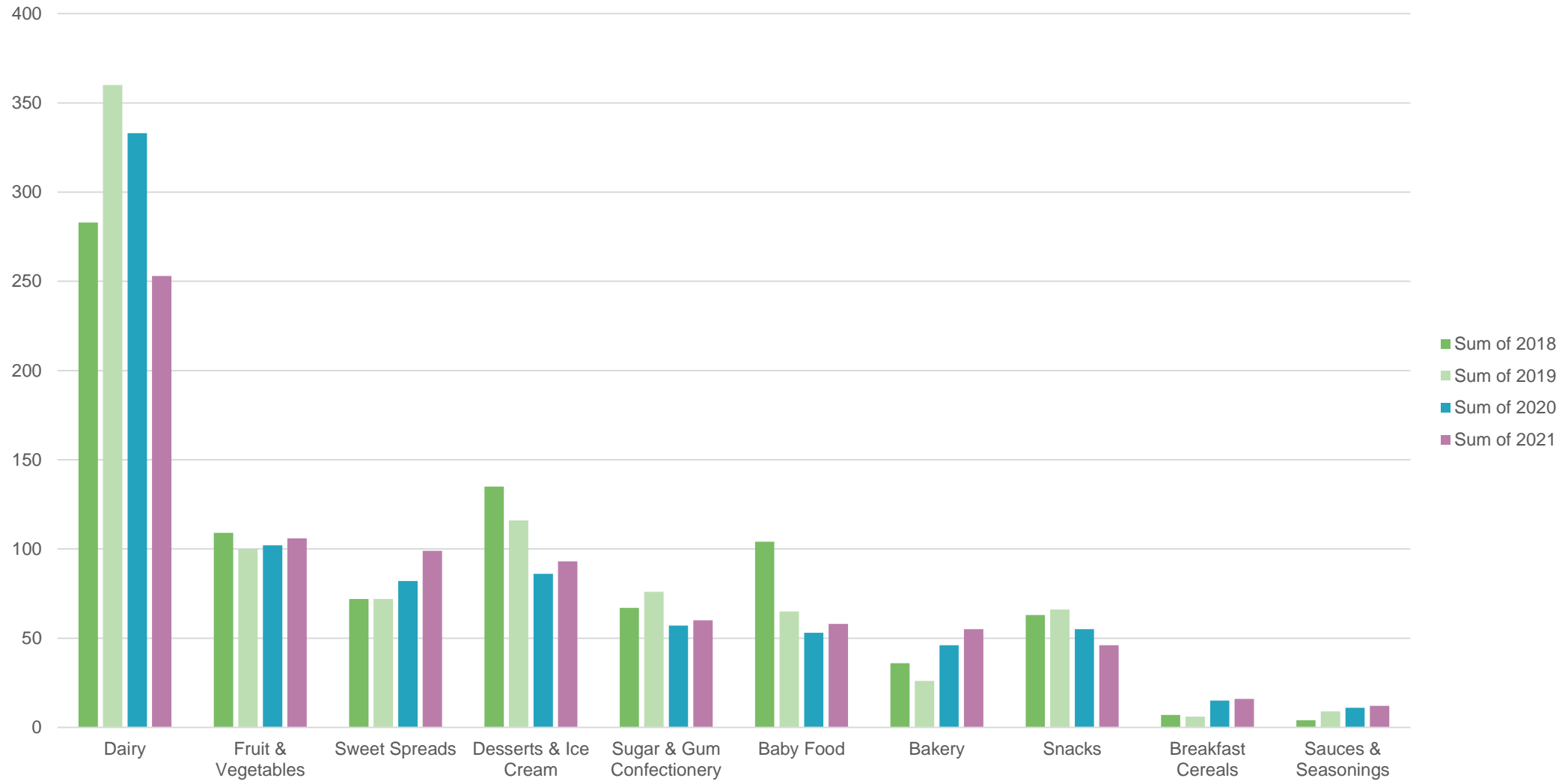


# Apricot vitamin supplement healthcare products with apricot in the ingredients launched, by vitamin supplement healthcare sub-category (New Products Launched 2018–2021)



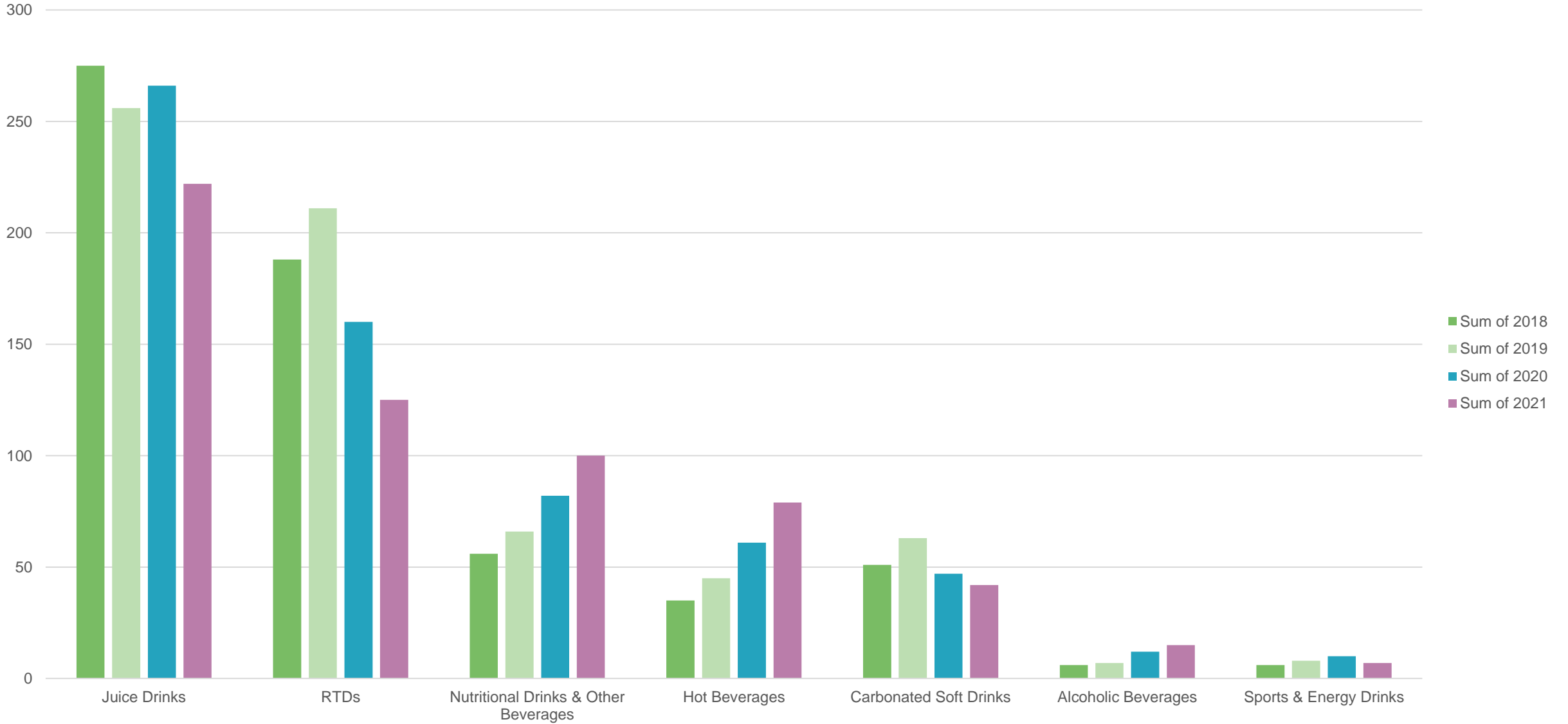


## Peach food products with peach in the ingredients launched, by food category (New Products Launched 2018–2021)



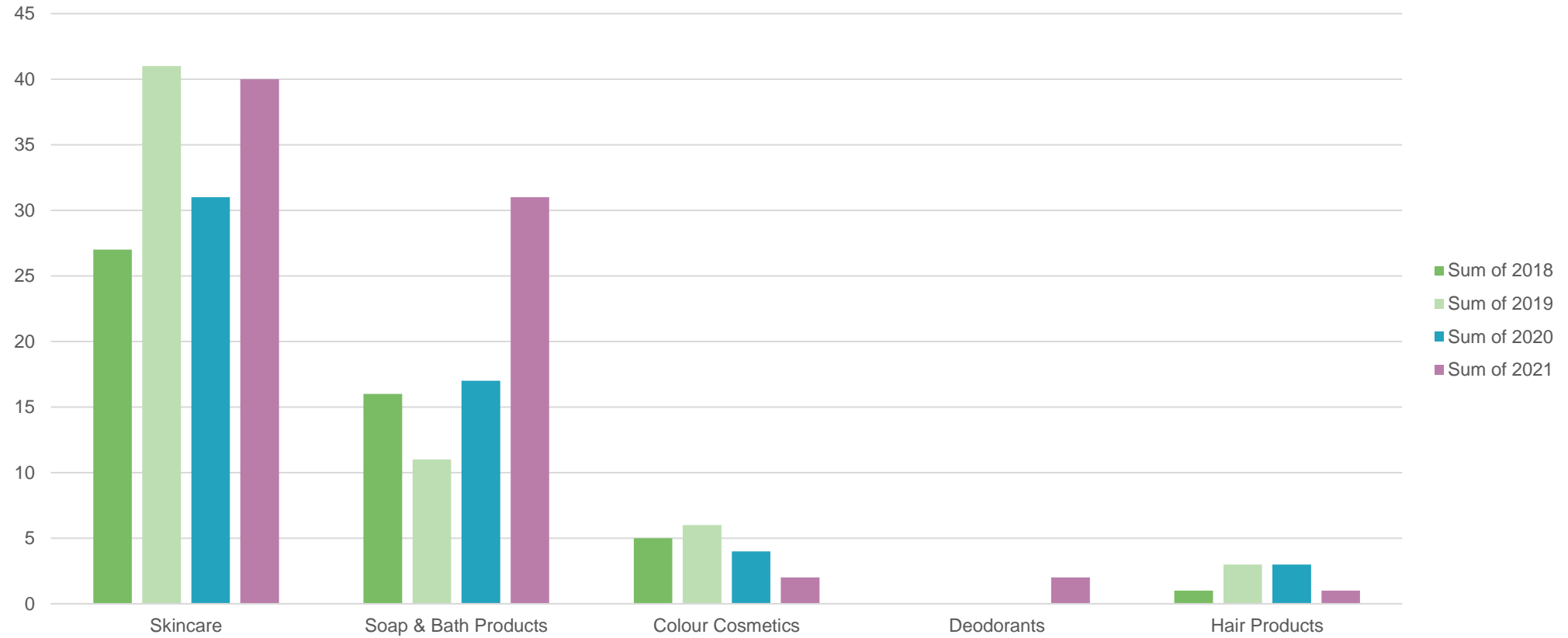


## Peach beverage products with peach in the ingredients launched by beverage category (New Products Launched 2018 - September, 2021)



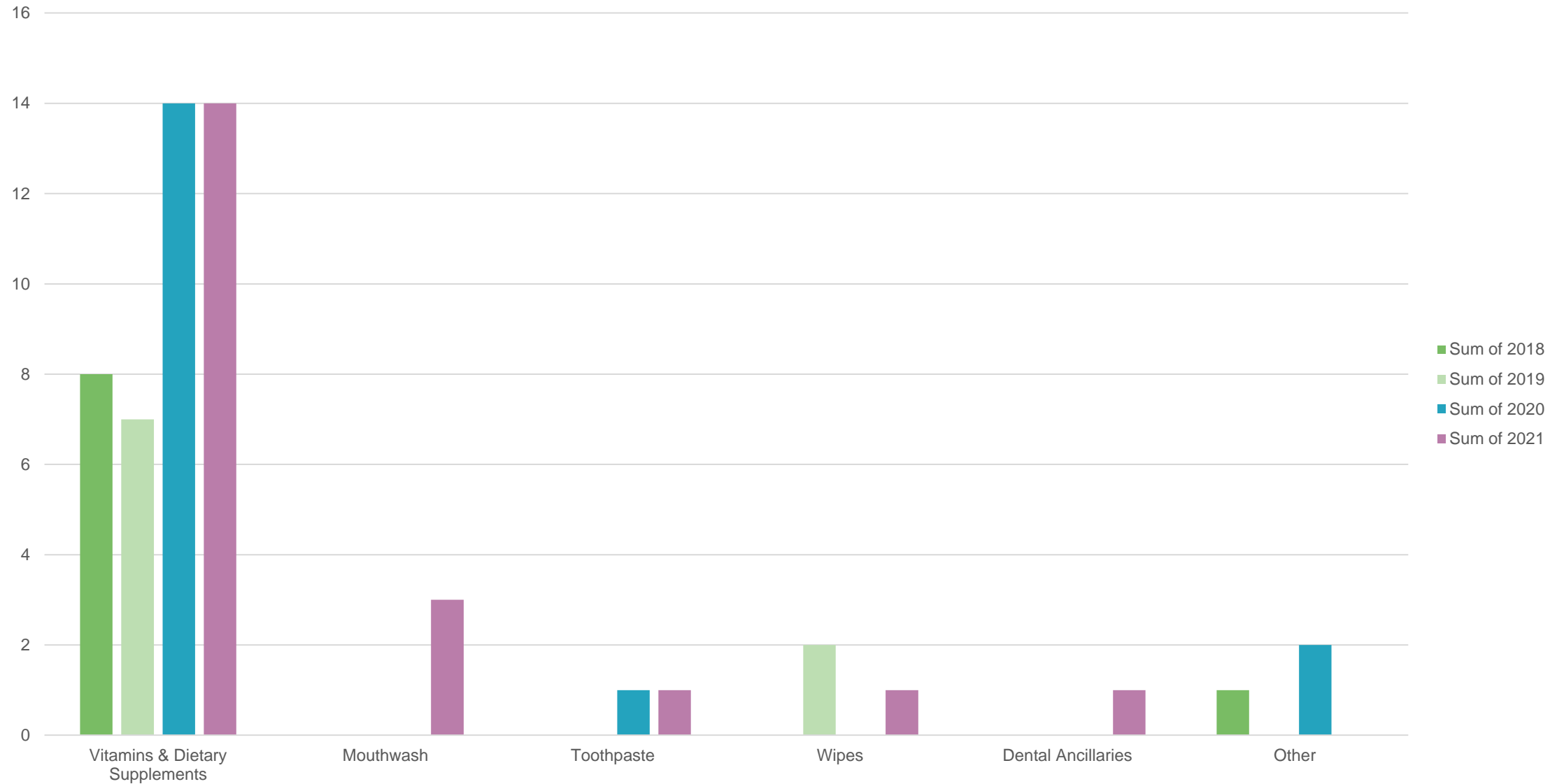


## Peach beauty and personal care products with peach in the ingredients launched, by beauty and personal category (New Products Launched 2018–2022)



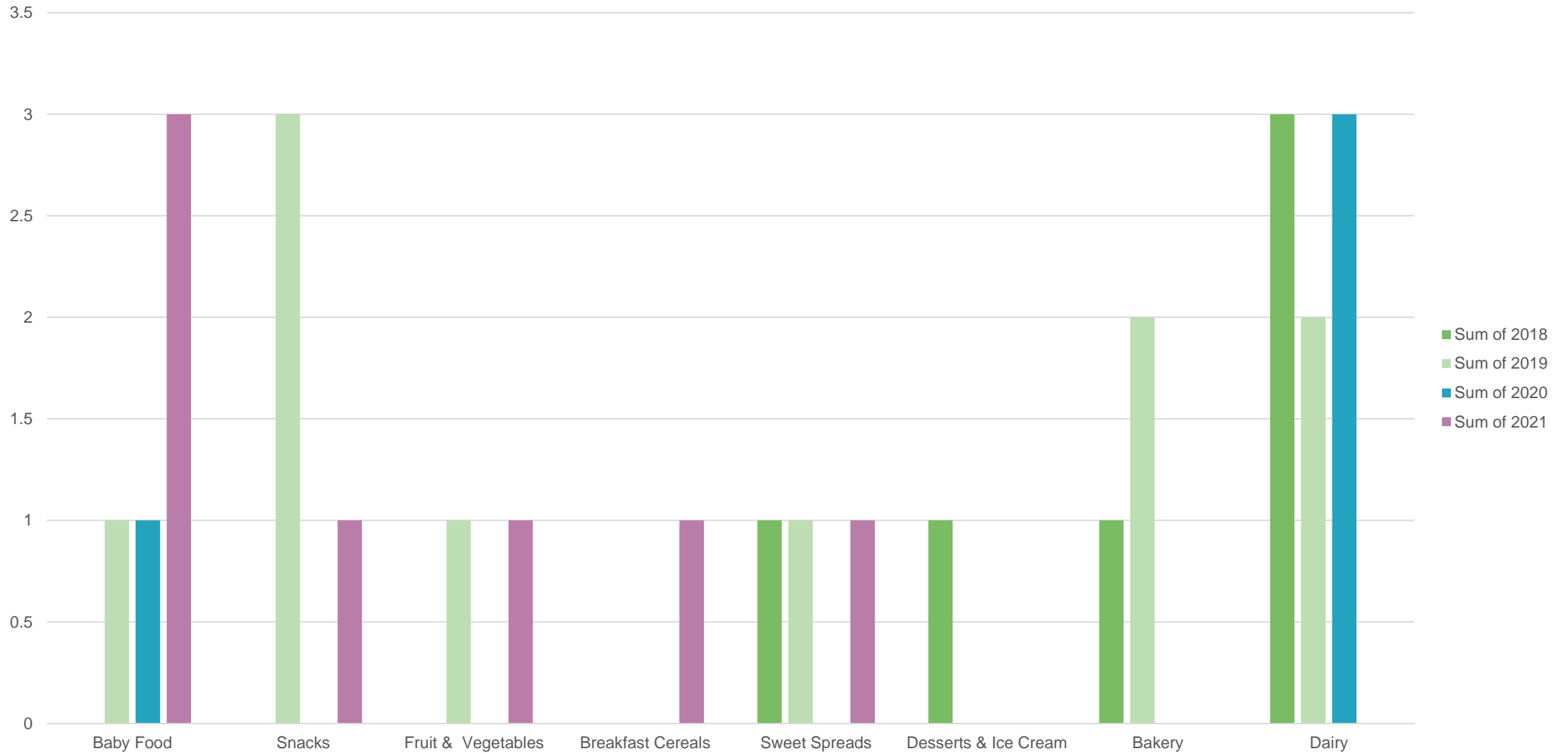


## Peach health and hygiene products with peach in the ingredients launched, by health and hygiene sub-category (New Products Launched 2018–2021)



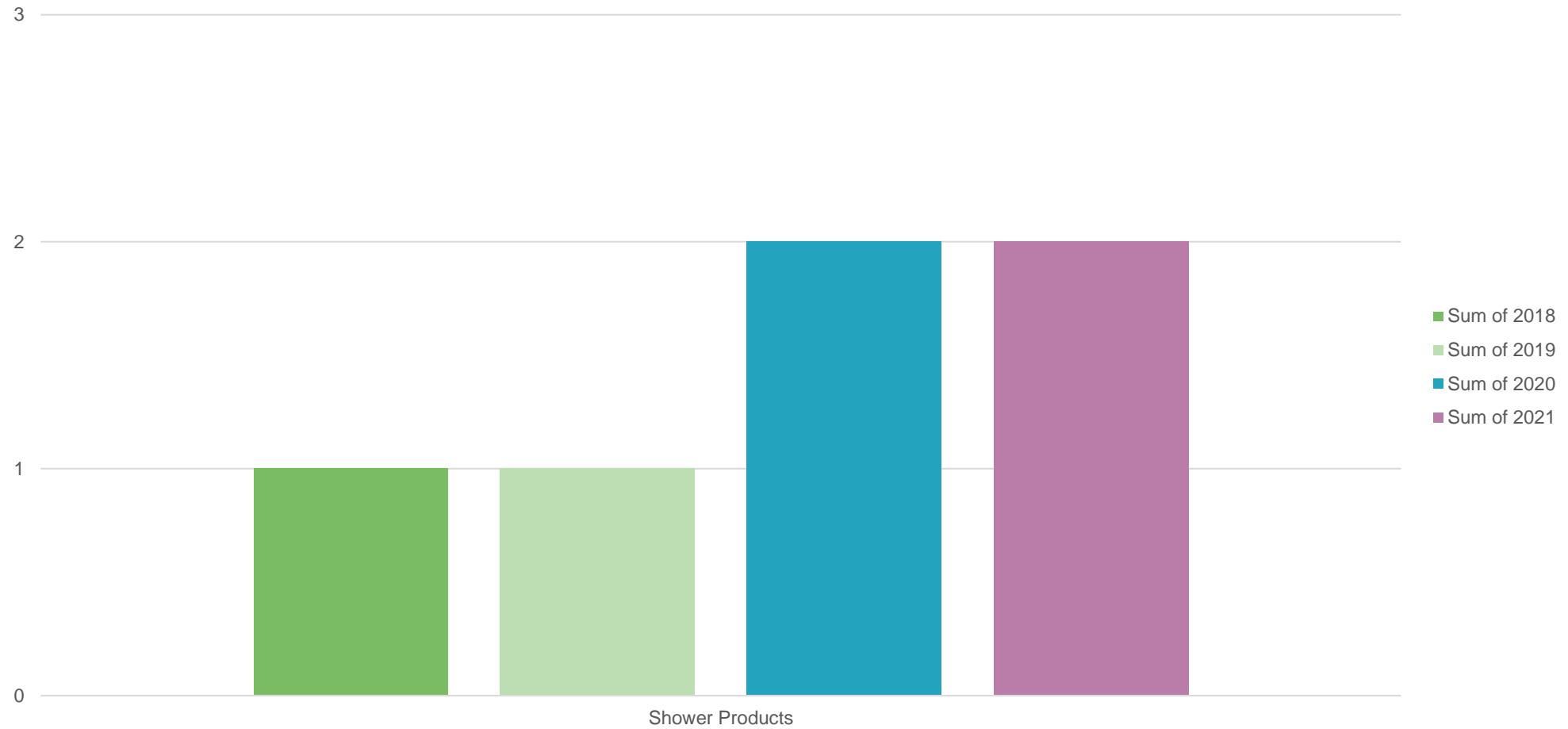


## Nectarine food products with nectarine in the ingredients launched by food category (2018 - September, 2022)





**Nectarine beauty and personal care products with nectarine in the ingredients  
launched, by beauty and healthcare sub-category  
(New Products Launched 2018– 2021)**





# Insights from New Product Launches



Upon review of the New Product Launch data presented, we have generated the following three insights as examples of how the data can be used:

- The 'Bakery' category is an area with reasonable activity across the fruits of interest – developing a suite of fruit-based bakery ingredients that could be sold in a B2B model could be an opportunity. See example 1 Fruit Pie Filling below
- There seems to be an increase in the amount 'Sweet spreads' of the fruits of interest. Jams and jellies have been historically a good outlet for second grade fruit. These products require minimal technical knowledge and use a well-known processing operations. There is an existing market for these products. Maintaining a profitable business is likely reliant on good distribution, a strong consumer brand, quality product and an acceptable price point. There may be an opportunity for willing Central Otago fruit growers to co-invest in a common brand, and supply fruit to a jointly owned facility or have jams made under contract by a toll processor. This opportunity and the unit operations required could fit in well with the insight above.
- Most of the beauty and skin care products contain little to no actual fruit so do not appear to be a good outlet for second grade fruit. However, this could present an opportunity to develop new products for this market that contain large concentrations of up-cycled fruits, which may provide a unique consumer value proposition.



# **Product Concepts & Processes**

# Product Concepts & Processes



- Around the world there are the typical commodity products, or commonly produced consumer products that are made from the by-products of fruit production.
- Typical processing steps include:
  - Thermal processing (canning)
  - Freezing
  - Drying
  - Extracting.
- Note that many of the existing commodity products are not particularly high value, except perhaps extracts.
- There is a need to have significant marketing budgets, strong brands, and good logistics to be successful in moving large volumes of commodity and other common products.

# Exemplar products made from fruit seconds



Product	Seconds Category	Byproduct remaining
Jams and preserves	Size, shape, cosmetic blemishes, splits	Trimnings, stems, seeds
Sauce (pouches)	Size, shape, cosmetic blemishes	Trimnings, stems, skin, seeds
Beverages	Size, shape, cosmetic blemishes	Pomace
Flesh pieces (IQF, in-bag/canned)	Size, shape, cosmetic blemishes	Peel, trimnings, seeds
Dried powders and slices (air and freeze dried)	Size, shape, cosmetic blemishes	Peel, trimnings, seeds
Fermented products (cider, vinegar, calvados)	Size, shape, cosmetic blemishes, splits	Pomace
Seed and peel extracts, nutraceuticals	Juice pomace, skins, seeds, smalls, ripeness, splits	Pomace
Pomace fibre	Juice pomace, ripeness	Trimnings, seeds
Flavour compounds	Juice concentrate	Pomace
Pigments	Skins, ripeness	Pomace
Pectin	Juice pomace, ripeness	Pomace (depectinased)
Citric acid	Crude sugars	Pomace
Ethanol/charcoal	Size, shape, cosmetic blemishes, ripeness, rots, damaged	-
Animal feed	Size, shape, cosmetic blemishes, ripeness, damaged	-

# Product Concepts & Processes



This section describes 10 product concepts that could be made from the by-products of fruit production. The concepts are based on recently launched products and were selected on the following criteria:

- High value/margin, or high retail price point
- Potential to upcycle large volumes of fruit by incorporating large concentrations of fruit in the product formulations
- Could be made with existing processing operations within the region, or with a reasonable amount of capital expenditure
- A propensity for flavour line extensions based on the targeted ACAPN fruits
- If new equipment is required, how specialised would the equipment be, i.e. would it or its product have only one use? The more uses the more appealing it would be, as it increases options and reduces risk.
- Ability to utilise other regional ingredients, such as Southland oats

Flow chart legend:

Unit  
operation

By-  
products

Additional  
ingredient  
inputs

# 1. Fruit pie filling (B2C or B2B)



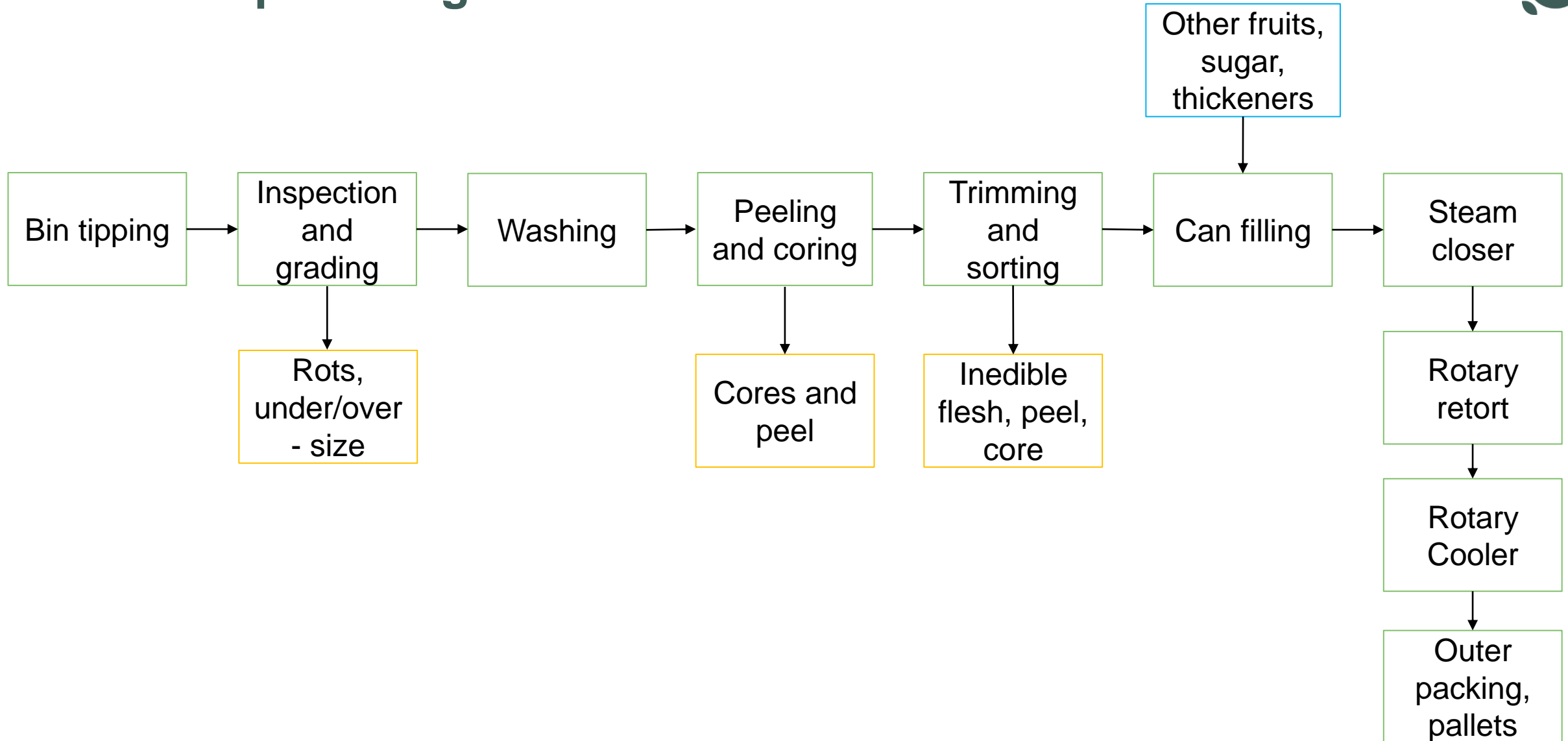
Product: Lucky Leaf canned apple pie filling  
Market: USA  
Retail in US Dollars: \$3.99/595 g  
Fruit content: <90–99% (estimate)

<https://www.luckyleaf.com/product/premium-apple-fruit-filling-or-topping/>

Possible line extensions could include blends with cherries, apricots, peaches — all popular pie fillings in the USA.

Pie fillings may find market opportunities in the consumer market and also in foodservice and manufacturing.

# 1. Fruit pie-filling flow chart



## 2. Fruit sorbets



Product:	Grycan Cherry Sorbet
Market:	Poland
Retails inUS Dollars:	2.48/500 mL
Fruit content:	50%

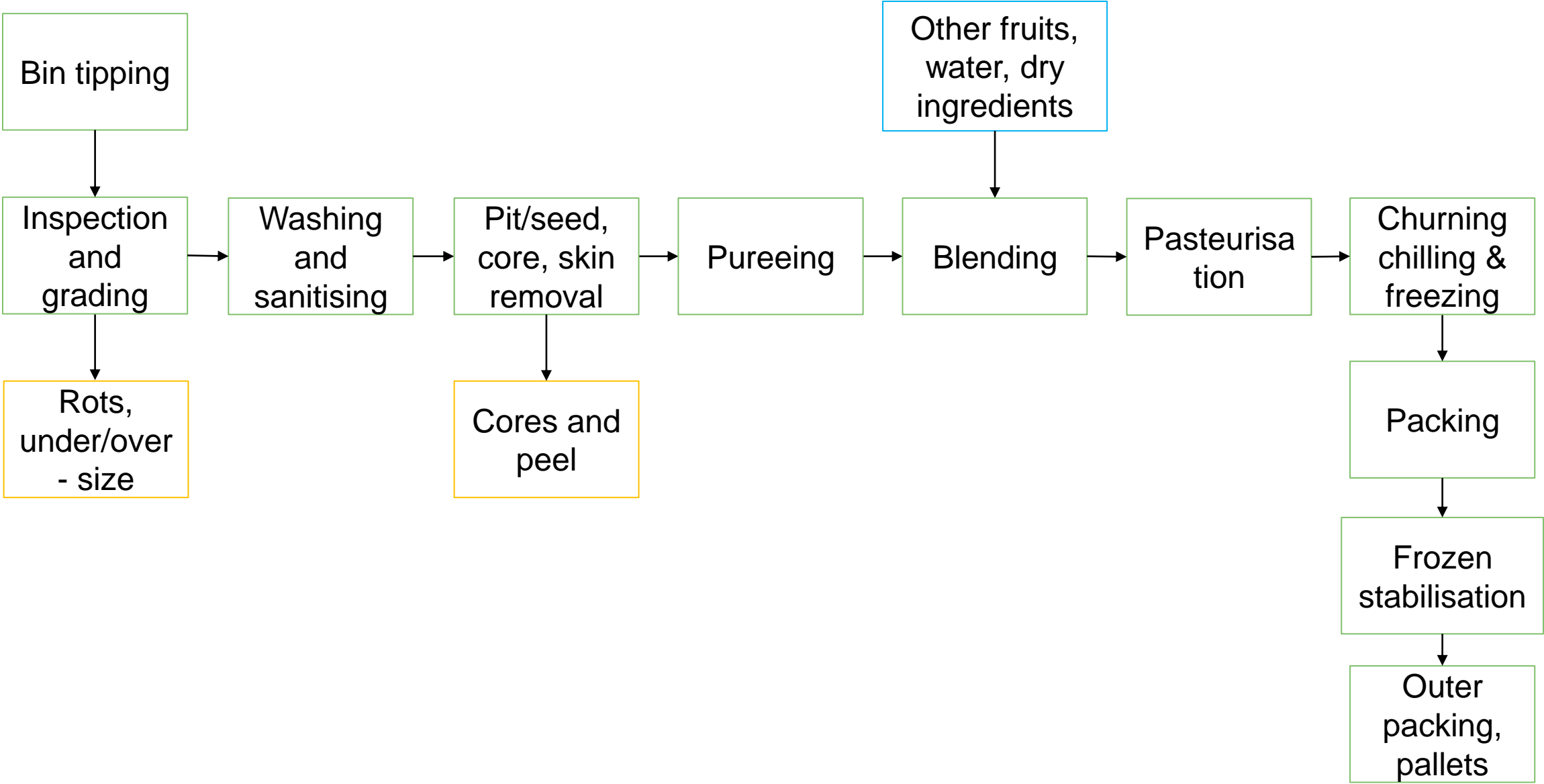
<https://grycan.pl/en/cherry/>

Line extensions with other fruits are feasible and probably expected by the supermarket trade.

As a price comparison in the New Zealand Market, Weis Mango Sorbet retails online at Countdown for \$11/1 L at 42% mango. The remaining ingredients are inexpensive (water, sugar, glucose syrup, thickeners, and citric acid).



# 2. Fruit sorbet flow chart



### 3. Frozen fruit pieces for smoothies



Product:	Revive-Jamba Juice Ready to blend fruit
Market:	USA
Retails in US Dollars:	7.99/222 g
Fruit content:	Up to 100%

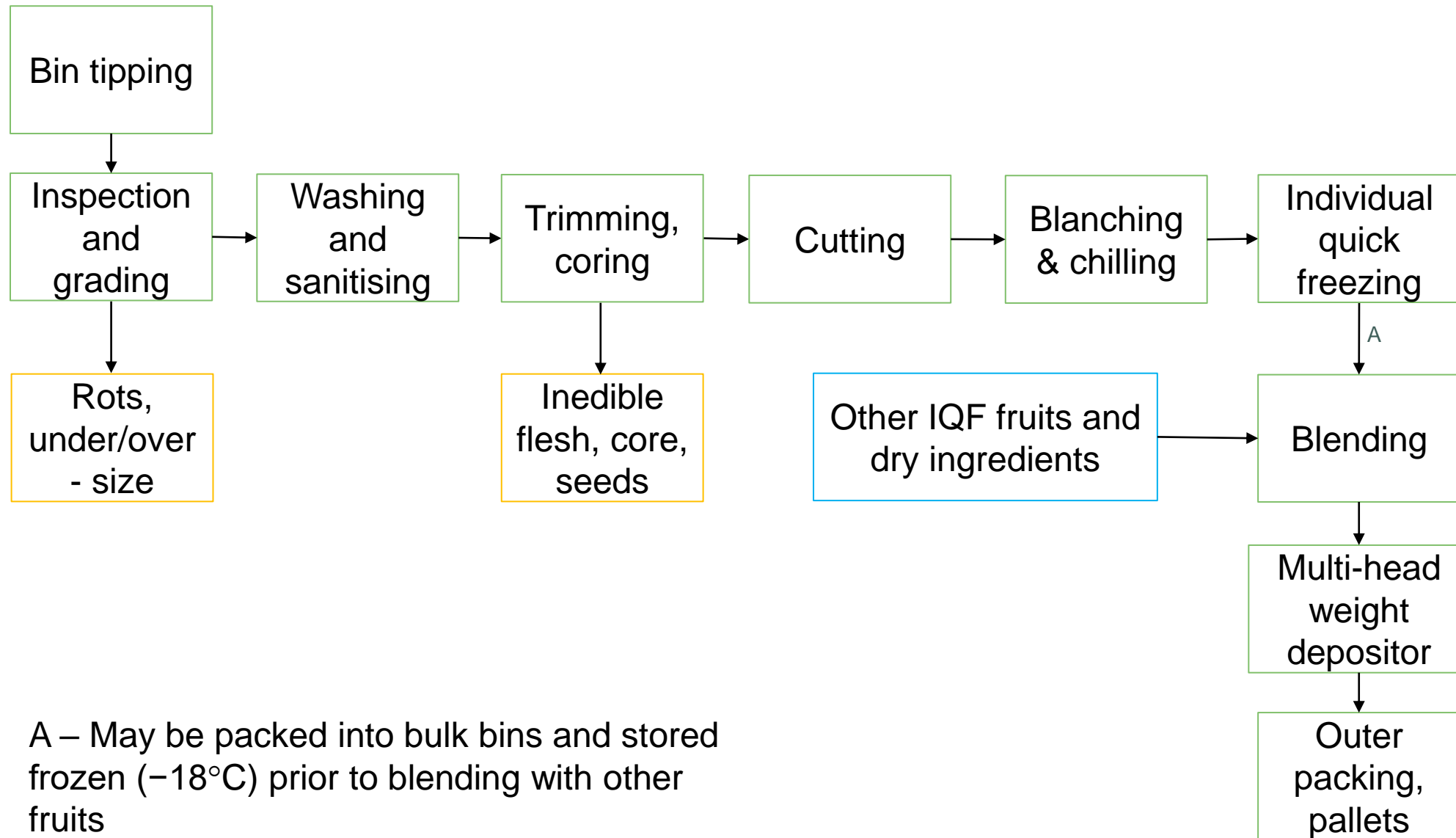
<https://www.jamba.com/athome>

An example of co-branding and smart marketing to add value to a basic product. A collaboration between Jamba Juice and Revive, where Revive sells half-filled cups of blends of individually quick frozen (IQF) fruit chunks. At home, the consumer adds their milk of choice and blends to make a smoothie.

Price seems very high value, but purchases of 9 or more units result in 50% off, free shipping and a free reusable straw.



### 3. Flow chart for frozen fruit pieces for smoothies



A – May be packed into bulk bins and stored frozen (-18°C) prior to blending with other fruits

## 4. Breakfast cereals with added fruit products



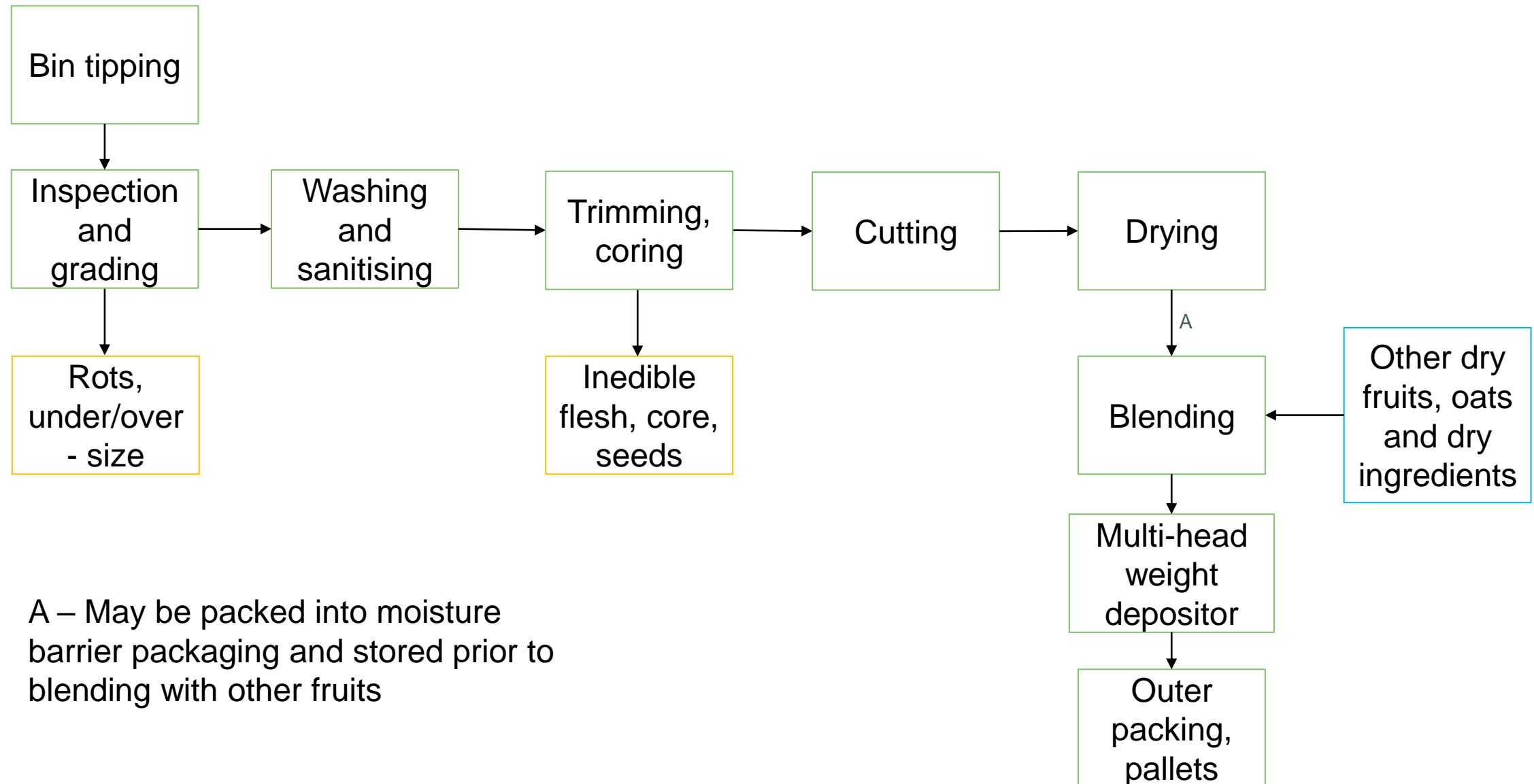
Product:	Oats Overnight bircher style muesli
Market	USA
Retails in US Dollars:	\$2.98/63g
Fruit content:	10–25%

<https://www.oatsovernight.com/>

Contains ‘Granny Smith’ apples (powder, diced). The bottles have space for the consumer to add water or their milk of choice. The mix is then shaken to combine and left to hydrate in the refrigerator overnight. Similar to a Bircher muesli

An opportunity to collaborate with other iconic South Island New Zealand foods,  
i.e., Southland oats, milk powder

# 4. Flow chart for breakfast cereals with added fruit products



A – May be packed into moisture barrier packaging and stored prior to blending with other fruits

## 5. Alcoholic beverages



Product:	Maruoroshi Peach Sour
Market:	Japan
Retails in US Dollars:	1.37/350 mL
Fruit content:	21% fruit juice

<https://entabe.com/48437/takarashuzo-sai-maruoroshi-peach>

This product contains peaches (USA, domestic, Spain), peach paste, peach syrup, and peach spirits.

There is a great deal of innovation occurring in the alcoholic drink space, e.g., craft beers, gins, alcoholic iced teas. Typically high value and volume per purchase. Many of these brewery and beverage companies are looking for ways to collaborate and tell good marketing stories with producers, so a good fit with upcycled foods with a provenance story.

# Cherry Lager

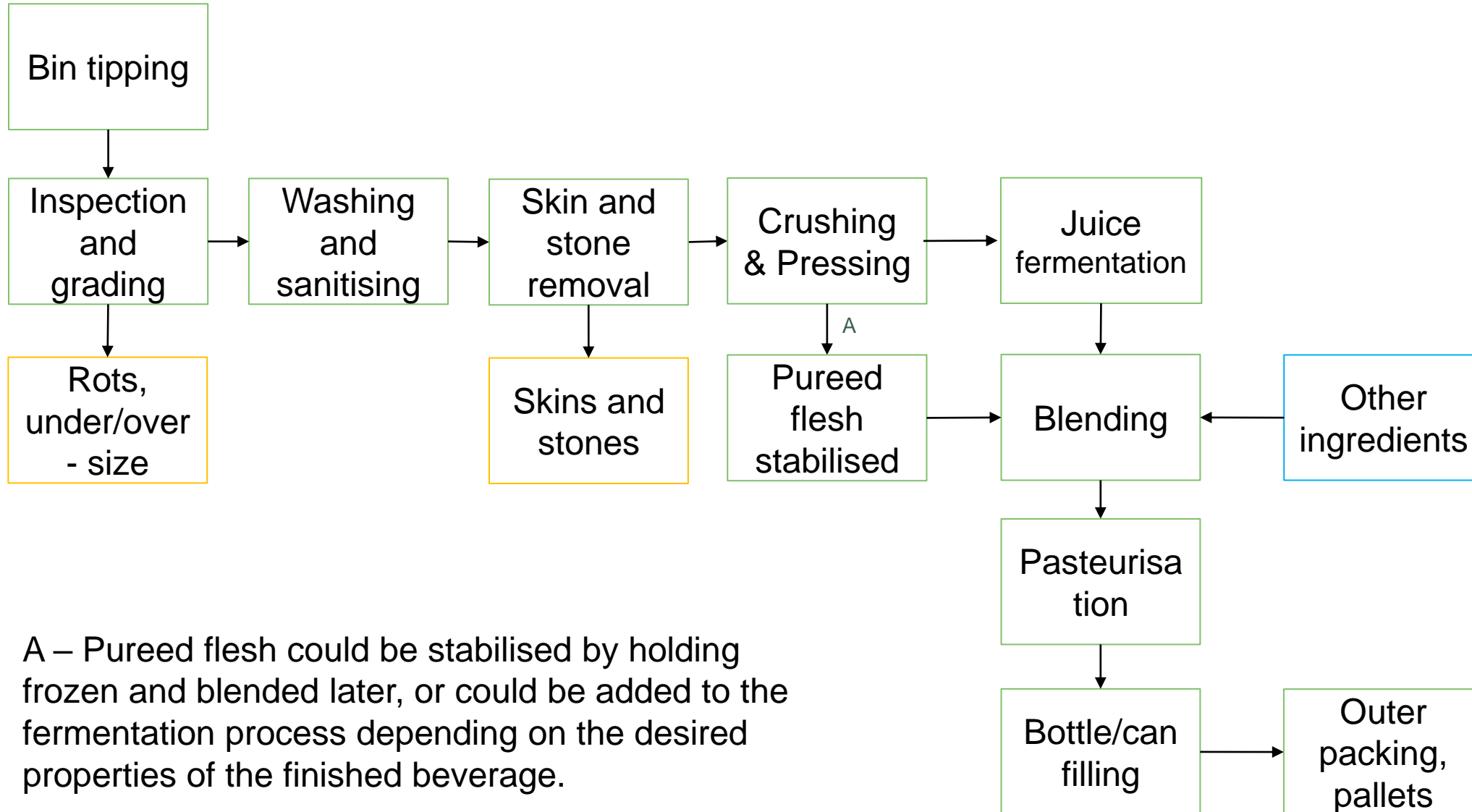


Product:	Ursus Cherry Lager
Market:	Romania
Retails in US Dollars:	0.96/500 mL
Fruit content:	Cherry juice concentrate (0.3%)

<https://untappd.com/b/ursus-breweries-sa-ciresar-cherry-lager/4127941>

This product has a fairly low concentration of cherries, but this may be reflected in the low retail price. However, the product has won awards for taste at international competitions.

# 5. Alcoholic beverages flow chart



A – Pureed flesh could be stabilised by holding frozen and blended later, or could be added to the fermentation process depending on the desired properties of the finished beverage.



## 6. Dried fruits



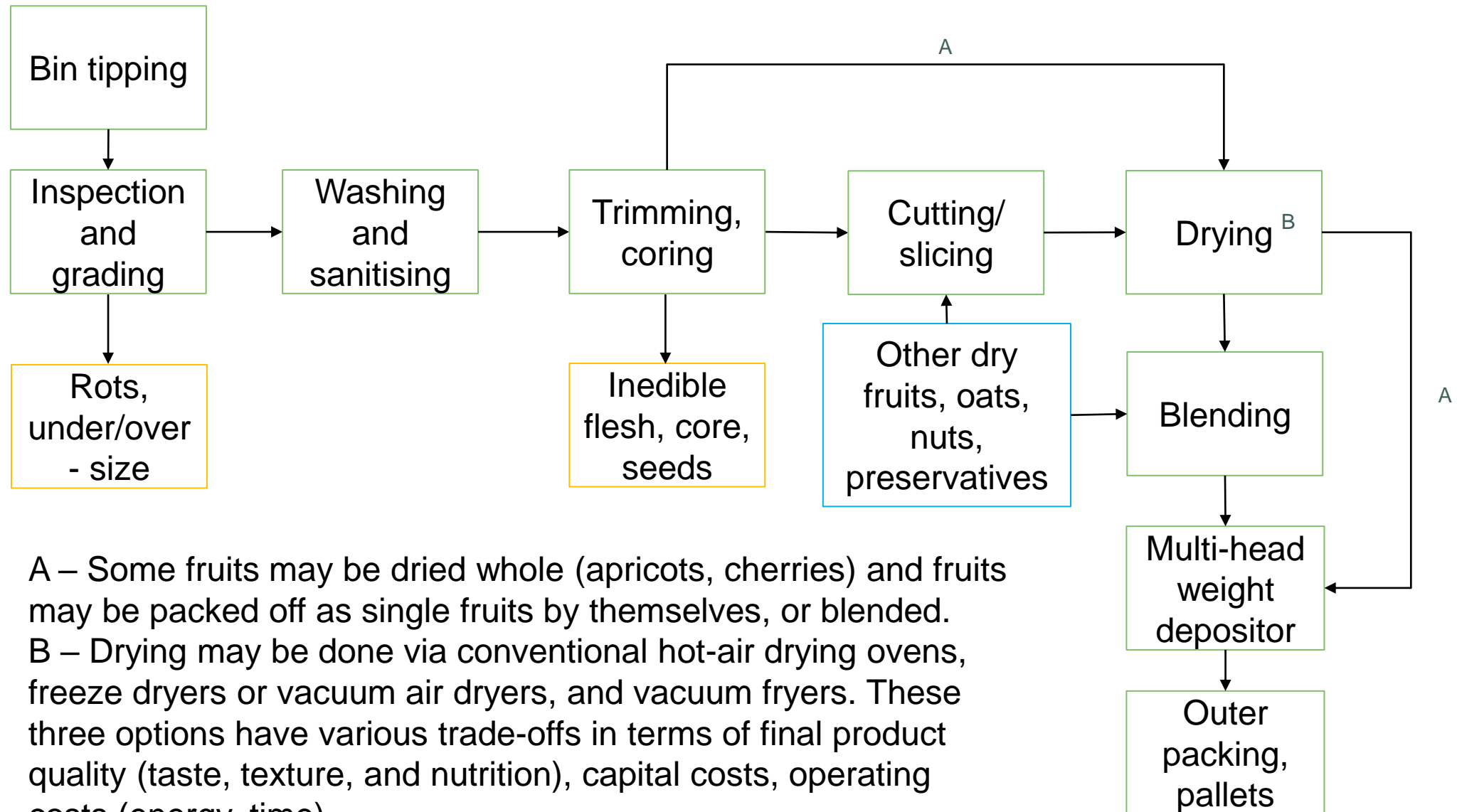
Product:	Ugly dried fruit
Market:	USA
Price in US Dollars:	\$6/113 g pack
Fruit content:	99%

<https://www.theugly.company/>

Drying fruit is a great way to stabilize and add value to fruit that would otherwise be lost. The Ugly Company has centralized their marketing and brand around the upcycling concept.

Cost works out to be ~US\$1 per fruit piece, but drying is an energy-intensive and therefore costly process.

## 6. Dried fruits flow chart



A – Some fruits may be dried whole (apricots, cherries) and fruits may be packed off as single fruits by themselves, or blended.

B – Drying may be done via conventional hot-air drying ovens, freeze dryers or vacuum air dryers, and vacuum fryers. These three options have various trade-offs in terms of final product quality (taste, texture, and nutrition), capital costs, operating costs (energy, time).

## 7. Bakery and biscuits with fruit filling and pieces

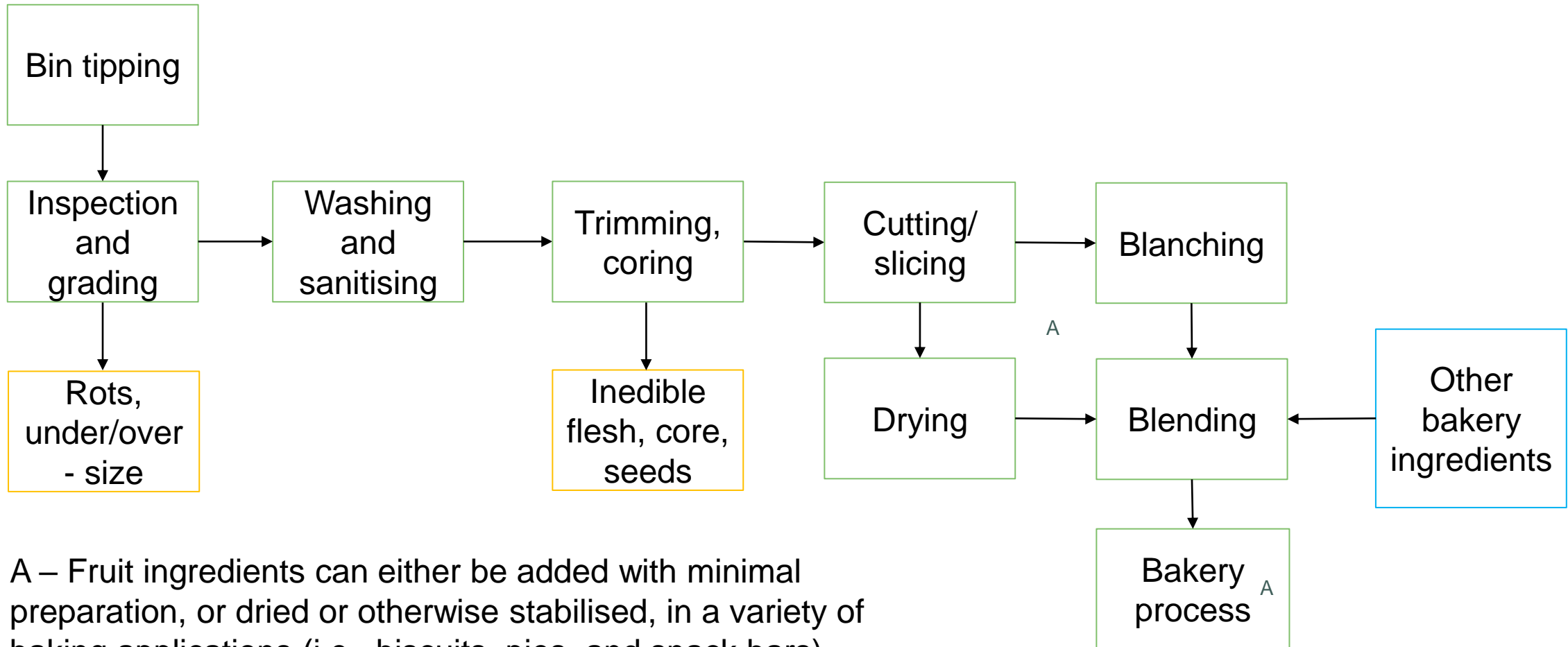


Product:	Apple biscuits/cookies
Market:	Croatia
Price in US Dollars:	2.58/350g
Fruit content:	apple jam (35%) (apple 45%, partially dry apple 3%)

<https://shop.desparsicilia.it/spesa-ritiro-negozio/viale-dellolimpo-24/prodotto/despar-despar-frollini-con-confettura-e-pezzetti-di-mela-350-g-379304>

Processed fruit products can make their way into the biscuit, snack bar and other dessert food categories in many ways. The opportunity may be in developing bespoke fruit ingredients for this market and partnering with companies seeking these types of products.

# 7. Flow chart for bakery products with fruit filling and pieces



A – Fruit ingredients can either be added with minimal preparation, or dried or otherwise stabilised, in a variety of baking applications (i.e., biscuits, pies, and snack bars).

## 8. Fruit purees



Product:	Go Go Squeez Happy Brainz
Market:	USA
Price in US Dollars:	\$6.98/90g
Fruit content:	Up to 100%

<https://www.gogosqueez.com/products/organic/happy-brainz/>

Fruit purees in convenient eat from the squeezable pouch through nozzle. These types of products can be formulated with other ingredients (other fruits, cereals, bio-actives) to create a range of products.

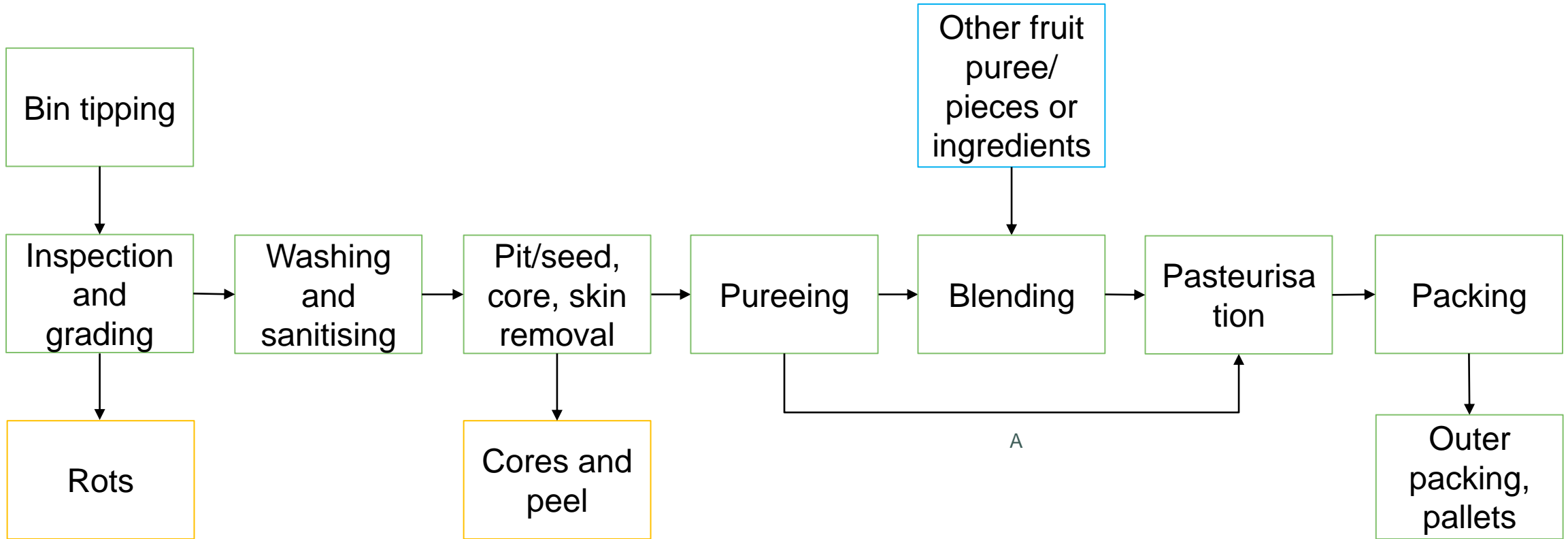
# White Peach & Nectarine Speciality (puree/sauce)



Product: Peach and Nectarine Velouté  
Market: France  
Retails in US Dollars: 2.03/4 x 97 g  
Fruit content: White peach (38%), nectarine (37%), apple (23%) (apple puree, concentrated apple puree)

<https://www.materne.fr/nos-pauses-fruitees/>

# 8. Fruit purees flow chart



A – Fruit purees may be packed off as single fruits or blended with other fruits and/or ingredients.

## 9. High-value functional beverages



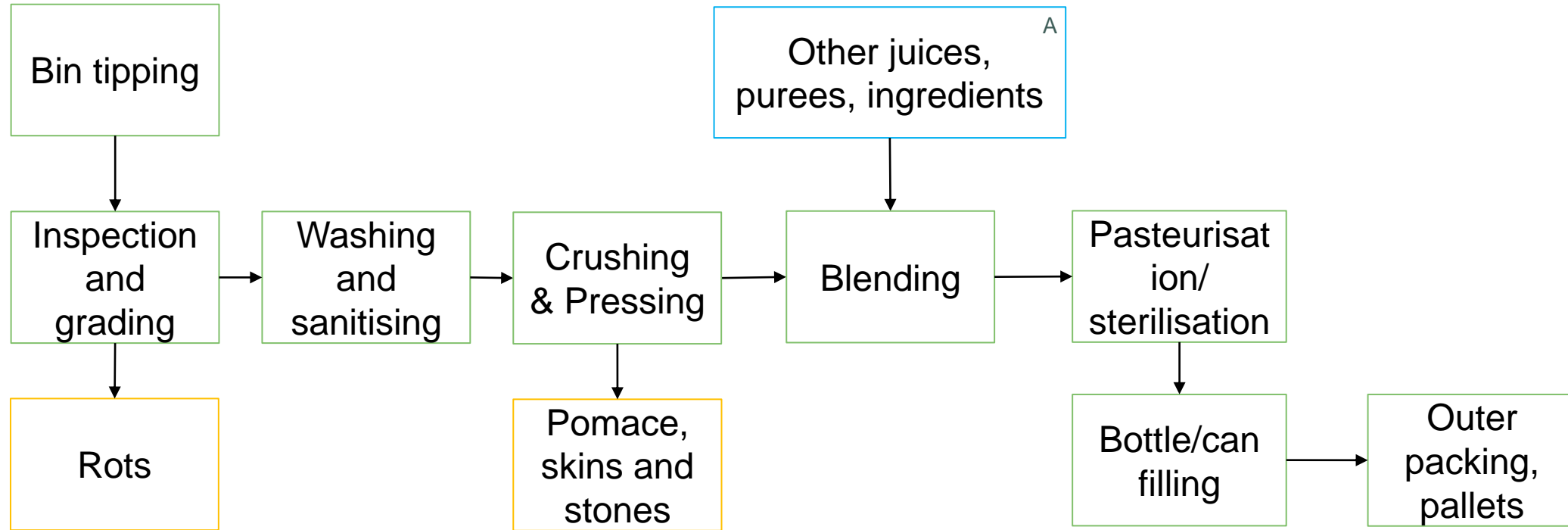
Product:	Sok Wiśnia, jabłko Morning Juice Energy Shot
Market:	Poland
Retails in US Dollars:	1.00/200ml
Fruit content:	Cherry juice* (60%), apple juice* (39.75%), guarana extract (0.25%)

<https://allegro.pl/oferta/shot-energia-200-ml-morning-juice-12386691808>

Additional value can be added to standard fruit juices by formulating them with bio-active ingredients. These bio-actives may carry a health halo, or the products can be validated by systematic reviews and scientific studies so that health claims can be made.



# 9. High-value functional beverages flow chart



A – Other juices, purees and bio-actives can be added to extend the product range and add value.

# 10. Nutraceutical ingredients and high-value extracts



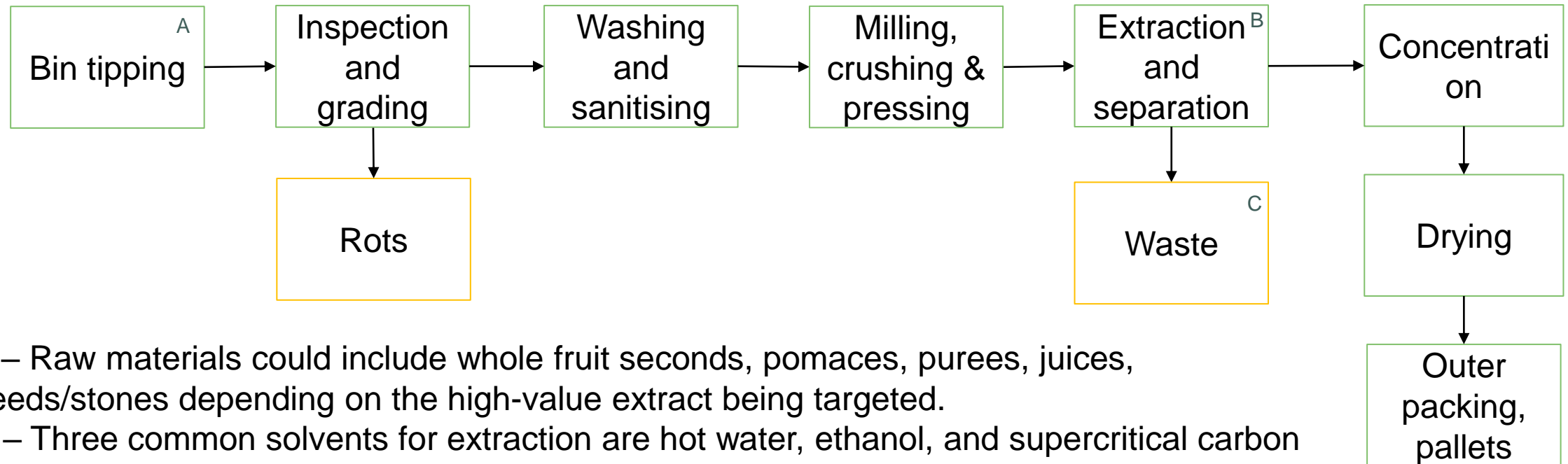
Product:	Nutreov Pectiligne appetite suppressant supplement
Market:	France
Price in US Dollars:	10.70/150g
Fruit content:	1 square (15g) is equivalent to the pectin of 5 apples

<https://nutreov.com/produit/pectiligne-carres-coupe-faim/>

Ingredients: Apple pectin (pectin, dextrose), apple seeds (sugar, glucose syrup, apple puree ...)

Formula of apple pectin to limit appetite. A plant-based ingredient — gels in the stomach from water-absorbing capacity.

# 10. High-value extracts flow chart

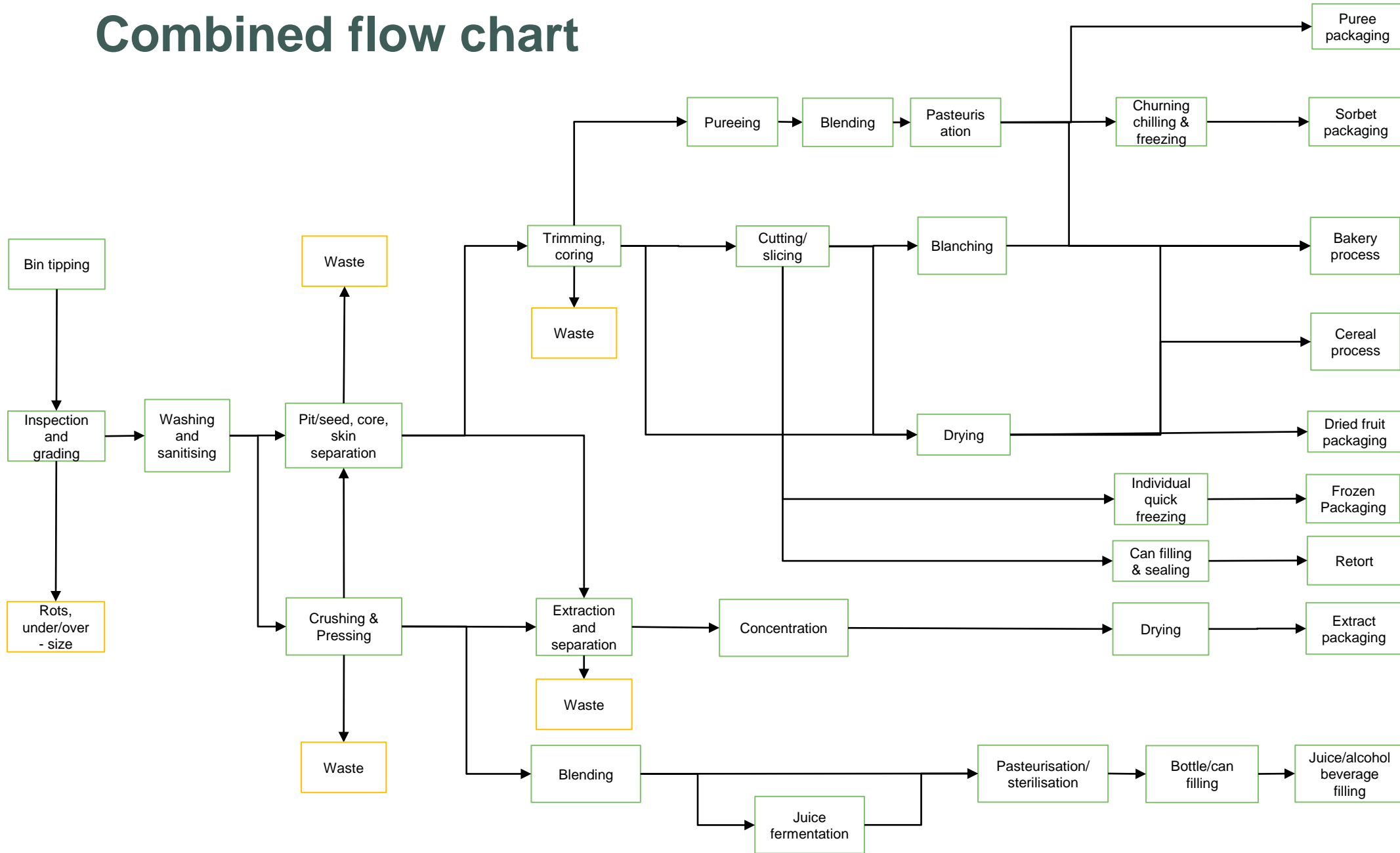


A – Raw materials could include whole fruit seconds, pomaces, purees, juices, seeds/stones depending on the high-value extract being targeted.

B – Three common solvents for extraction are hot water, ethanol, and supercritical carbon dioxide. These three options have various trade-offs in terms of final product quality (maintaining bioactivity, percentage recovery of bio-active), capital costs (ethanol safety), operating costs (energy, time).

C – The waste remaining after extraction depends on the high-value extract being targeted as the main product.

# Combined flow chart





# **Conclusions & Recommendations**

# Conclusions and recommendations



- Product launch data can be used to support business and marketing strategies:
  - what categories are on the rise/falling for areas of potential growth and demand
  - where is there competition in the market
  - what areas are opportunities for development for B2B ingredients.
- New product launches must have a value proposition that resonates with the target consumers. These value propositions for loss use can be built on the following elements:
  - Upcycling
  - Provenance
  - Nutrition and functional food claims
  - Co-branding
  - Linking with consumer trends such as convenience, health, indulgence foods.
- New product launches need to consider margin, fruit content, and costs associated with capital expenditure, operating costs, seasonality, and labour requirements.



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# Thank you

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