# Section 6.3 HACCP – Shelf-Stable Non-Alcoholic Beverages

6.3.1 Product Description - Shelf-Stable Non-Alcoholic Beverages

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| **Product Name:** | Non-alcoholic beverages |  |
| **Description** | Non-alcoholic beverage is a beverage containing less than 1.15% alcohol by volume. | |
| **Variant Examples** | Ginger Beer, Lemonade, Cola | |
| **Product use** | Direct consumption  Culinary use | |
| **Intended customers** | General public – Adults  (Not intended for children and pregnant women) | |
| **Potential for Abuse** | Negligible; products are shelf stable. | |
| **Ingredients** | Water, sugar, fruit, herbs, spices, flavourings, colourings, additives (e.g., preservatives, food acids, sweeteners), processing aids (e.g., gases) etc. | |
| **Product Storage Requirements and Display Shelf Life** | Non-alcoholic beverages that are typically shelf stable can be stored in ambient conditions. Typically for best quality it is recommend the Non-alcoholic beverage is chilled prior to consuming. | |
| **Preparation and serving** | Products are all ready to eat (drink). | |
| **Packaging** | Bottle, Cans, etc | |
| **Transport Conditions** | Ambient | |
| **Labelling** | Designed to meet the requirements of the Food Standards Code (Parts 1 and 2) – as applicable | |
| **Regulatory Limits – Food Standards Code** | Food Standards Code   * General labelling requirements * Composition as specified in Standard 2.6.2 Non-Alcoholic Beverages and Brewed Soft Drinks * Permitted additives and level of use as specified in Schedule 1 of Standard 1.3.1 Permitted processing aids and level of use as specified in Schedule 1 of Standard 1.3.3 | |

6.3.2 Identification of Hazards from Inputs

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| **Inputs** | **Description/Specification** | **Biological Hazard (B)** | **Chemical Hazard (C)** | **Physical Hazard (P)** |
| Clean water | Complies with the requirements defined in the Food Notice - Requirements for Food Control Plans & National Programmes | None | None | None |
| Fresh or frozen fruit, fruit juice or pulp | Suitable for food use  Sourced from an approved supplier | Enteric pathogen (e.g., *Salmonella* spp., *E. coli* spp., C*ryptosporidium* spp.)**2**  Patulin in apples**3** | Residues of agricultural chemicals (e.g., pesticides, fungicides)**1** | None |
| Additives (e.g., preservatives, food acids, sweeteners, colourings etc) | Food grade.  Permitted for use in Non-alcoholic beverage and used within limits specified in standard 1.3.1 of the Food Standards Code. | None | Sulphite**4** | None |
| Processing aids (e.g., gases) | Permitted for food use as specified in Standard 1.3.3 of the Food Standards Code. | None | None | None |
| Spices | Food grade | Bacterial pathogens (e.g., *Salmonella* spp., *Bacillus* spp., *Clostridium* spp.) | None | None |
| Other foods e.g., sugar, honey | Food grade | Bacterial pathogens (e.g., *Clostridium* spp.) | None | None |
| Flavourings | Food grade | None | None | None |
| Gas | Food grade | None | None | None |
| New bottles, cans, closures | Food grade | None | None | None |
| Used (reuse) bottles | Sanitised | Bacterial pathogen | Chemical or non-food suitable residues | Foreign matter (e.g., metal) |

Footnotes:

1. Grains may contain residues of agricultural chemicals, but grain that is sourced from suppliers that comply with good agricultural practices (GAP) have been considered to meet the requirements of the Food Notice - NZ Maximum Residue Limits for Agricultural Compounds, as such chemical residues were not considered any further in the hazard analysis above.
2. *Salmonella* spp., *E coli* O157, and *Cryptosporidium* spp. have been implicated in outbreaks in the United States involving the consumption of unpasteurised apple juice (Johnson et.al., 2006). The presence of these enteric pathogens on fruit and in fruit juice has been attributed to some form of faecal contamination from animals grazing in orchards (Keller and Miller, 2006).

Some orchard operators in New Zealand allow animals to graze in their orchards, thus there is potential for faecal contamination of applies that drop on the ground. Exclusion of dropped applies will minimise the occurrence of these hazards on the fruit and in the extraction fruit juice.

1. Patulin is a mycotoxin that is produced primarily by certain species of *Penicillium*, *Aspergillus*, and *Byssoclamys* moulds that may grow on a variety of foods including fruit. Patulin has been found to occur in apples and pears with brown rot, and in apple juice (US FDS 2000). Contamination of apple juice has been attributed to contamination with mould on apples with surface damage. Although there are no known published reports on the occurrence of patulin in apple juice and apple products produced in New Zealand, the potential for patulin contamination in apples and apple juice have been considered in the hazard analysis. Control for patulin is covered in the hazard analysis above.
2. Sulphite can induce asthma in susceptible individuals.

6.3.3 Process Flow – Shelf-Stable Non-alcoholic beverage

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| **Inputs** | **Process Step** | **Outputs** |
|  | Purchasing |  |
| Raw Materials:   * Dry goods (sugar, spices, additives) * Fruit, fruit juice etc * Packaging | 2.  Receiving |  |
|  | 3.  Storage |  |
| * Raw Ingredients   E.g., sugar, fruit, herbs, spices, flavourings, colourings, additives (e.g., preservatives, food acids, sweeteners) | 4.  Blending/Mixing |  |
| * Carbon dioxide | 5.  Carbonation |  |
| * Packaging | 6.  Packaging |  |
|  | 7.  Storing |  |
|  | 8.  Dispatch/Transport | - Packaged Non-alcoholic beverage |

6.3.4 Process Hazard Analysis - Shelf-Stable Non-alcoholic beverage

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| **Process** | **Inputs** | **Hazard reasonably likely to occur on or in the product at this step** | **Justification** | **Q1. Is there a control measure(s) for the hazards at this step?** | **Q2. Is this step a CCP?** |
| 1. Purchasing | All food and product contact raw materials | See Section 6.3.3 | Hazard from raw materials not meeting regulatory requirements. | Yes – The Company operates an Approved Supplier Programme. | No |
| 2. Receiving | All food and product contact raw materials  Fresh/frozen fruit | B – Enteric pathogens  B – Patulin in apple juice | Refer to 6.1.2 | Not applicable | No |
| 3. Storing | All food and product contact raw materials | B – Enteric pathogens | Hazards from poor storage methods and unclear environment. | Yes – Refer Section 2.2.2 Storage of Raw Materials. | No |
| 4. Blending / Mixing |  | B – Enteric pathogens | Hazards carried from previous step | None | No |
| 5. Carbonation | None | None | Not applicable | No | None |
| 6. Packaging | Glass bottles, cans, kegs, gas | P – Glass fragments | Incorrect filler operation can result in chipping | Yes – correct equipment set-up and maintenance, routine observation during filling, filtration of any affected Non-alcoholic beverage. | No |
| 7. Storage | Packaged Non-alcoholic beverage | None | None | Not applicable | No |
| 8. Dispatch and Transport | Packaged Non-alcoholic beverage | None | None | Not applicable | No |

6.3.5 Critical Control Points

A Critical Control Point (CCP) is a step at which an identified hazard can be eliminated or reduced to an acceptable level. Control at the CCP must be linked to the achievement of an established food safety outcome (i.e., product or process criteria). A CCP must have a defined critical limit which is measurable and capable of being monitored on a real time basis so that immediate corrective action can be undertaken.

Pasteurisation as CCP? – could be for a juice or similar – worth discussing – note have changed to a ‘Shelf-Stable’ beverage, as otherwise the field is pretty wide?

Bottle washing as CCP?

Addition of preservatives if making some products – juice base etc??- for food safety or storage? Refrigeration and shelf-life may be factors?

6.3.6 Food Safety - Shelf-Stable Non-alcoholic beverages

Shelf-stable non-alcoholic beverages are generally considered as intrinsically safe given appropriate processing and hygiene conditions have been employed in their manufacture. This is typically due to the variety of “hurdles” that exist to achieve control of product safety both intrinsic and extrinsic. Hurdles may include pasteurisation, anaerobic conditions (carbonation), anti-microbial processes (acidification) and packaging (tamper proof seals). Supporting these hurdles are the pre-requisite good operating practices ensuring appropriate hygiene conditions are maintained throughout the process.