

1 FOREWORD

2

3 Given the food safety issues surrounding coconut water/drink, its trade and their
4 impact to the small and micro-producers, this standard is therefore developed to ensure
5 that chilled young coconut water/drink produced in the Philippines are
6 microbiologically safe and comply with regulatory requirements.

7

8 This Code addresses the essential principles of food safety applicable to primary
9 production, postharvest, transport operations and primary processing of chilled young
10 coconut water/drink. The Bureau of Agriculture and Fisheries Product Standards
11 (BAFPS) developed the Philippine National Standard (PNS): Chilled young coconut
12 water/drink - Specification (PNS/BAFPS 28:2006) in 2006. This Code, therefore,
13 supplements the PNS/BAFPS 28:2006 or its latest revision and should be read in
14 conjunction with it.

15

16 A Technical Working Group (TWG) for the development of the Code of Hygienic Practice
17 for Chilled Young Coconut Water/Drink was organized and represented by Philippine
18 Coconut Authority (PCA), Industrial Technology Development Institute (ITDI), Food and
19 Drug Administration (FDA), United Coconut Associations of the Philippines (UCAP) and
20 the Philippine Coconut Research and Development Foundation, **Inc.** (PCRDF).

21

22 The Bureau of Agriculture and Fisheries Standards in collaboration with the members of
23 the TWG conducted a series of technical reviews for the drafting of the standard and
24 public consultations participated by stakeholders from the National Capital Region
25 (NCR) and Region IVA. Comments gathered from the consultations with the
26 stakeholders were considered and deliberated prior to the finalization of the standard.

27

28

29 **INTRODUCTION**

30

31 Coconut is an agricultural and livelihood crop for many people in Southeast Asia, the
32 Pacific region, Africa and some countries in Latin America. In fact, it is considered as the
33 “tree of life” in developing countries as they depend on it as a source of food, medicine,
34 shelter, fuel and furniture among others (Magat, 2006). Based on 2013 Philippine
35 Statistics Authority (PSA) data, Quezon has the largest area planted to coconut followed
36 by Zamboanga del Norte, Leyte, Davao Oriental, and Zamboanga del Sur.

37

38 According to Philippine Coconut Authority (PCA), the coconut tree provides fruit
39 throughout the year which is edible at any stage of maturity. The fruit also serves as the
40 source of raw material in many food products such as coconut milk and cream,
41 desiccated coconut, coconut chip, coconut water, nata de coco, coconut oil, etc. Aside
42 from the use of coconut water as tropical beverage, it is also used as a microbiological
43 growth medium (Prades, et al 2012).

44

45 Coconuts continue to respire after harvest. High temperature at harvest increases its
46 respiration rate that leads to rapid physiological changes and eventual deterioration.
47 Other factors that may negatively affect the quality of coconut water are pesticide
48 residues, heavy metals and undesirable microorganisms. During production, these
49 chemical contaminations can be absorbed through soil or water. And undesirable
50 microorganisms enter the fruit during postharvest operations through improper
51 handling and processing leading to rapid fermentation (Agriculture and Consumer
52 Protection Department – FAO, 2007). Within the nut, coconut water is sterile and is free
53 from microorganisms but when exposed to air or to the environment, the product is
54 prone to microbial contamination and deterioration. On the other hand, proper
55 handling and management throughout the postharvest and processing method are
56 important to make sure that coconut water will retain its inherent qualities prior to
57 processing (FAO, 2007).

58

59 Today, consumers demand for products that are of high quality, safe for consumption
60 and nutritious. Coconut water, even in the domestic market is gaining popularity as a
61 ‘healthy drink’. It is considered as an alternative beverage for rehydration after
62 exercise-induced dehydration. With these market opportunities, extending the shelf life
63 and ensuring the safety of the product are among the known challenges of the industry.
64 Packaging is seen as the next frontier in ensuring consumer availability for coconut
65 water.

66

67 Special Order No.600 series 2014 established the TWG tasked to conduct field
68 validation studies; sample products for the purposes of various analyses; and draft and
69 finalize the COHP. The members of the TWG include identified experts from the various
70 government agencies such as Philippine Coconut Authority (PCA), Industrial
71 Technology Development Institute (ITDI), Food and Drug Administration (FDA); and
72 industry association **such as** United Coconut Association of the Philippines (UCAP) and
73 Philippine Coconut Research and Development Foundation Inc. (PCRDF).

74

75 This **Code of Hygienic Practice** (COHP) addresses the essential principles of food safety
76 applicable to primary production through processing, packing, and distribution of
77 coconut water/drink. It encompasses Good Agricultural Practices (GAP), Good Hygienic
78 Practices (GHP) and Good Manufacturing Practices (GMP) that will help minimize
79 microbiological hazards associated with all stages of production to processing.

80

81 This Code provides general recommendations to allow flexible and uniform adoption
82 even when production practices and environmental conditions are diverse. Therefore,
83 this Code is also applicable to micro and small-scale producers.

84

85 **SECTION 1 - OBJECTIVES**

86

87 The objective of this Code is to provide specific guidance to chilled young coconut
88 water/drink or “buko juice” producers by applying relevant recommendations of the
89 Codex Recommended International Code of Practice-General Principles of Food Hygiene
90 (CAC/RCP 1-1969, Rev 4:2003) and the Revised Guidelines on Current Good
91 Manufacturing Practice in Manufacturing, Packing, Repacking, or Holding Food
92 (Department of Health Administrative Order No. 153 S. 2004) or its latest issuance.
93 Specific guidance is provided to minimize microbiological hazards from primary
94 production through processing, packing and distribution of coconut water/drink.

95

96 The Philippine National Standard (PNS) Code of Good Agricultural Practices for Fresh
97 Fruits and Vegetables (GAP) and Codex Code of Hygienic Practice for Fresh Fruits and
98 Vegetables (CAC/RCP 53-2003) already provide the relevant general hygienic
99 recommendations for the primary production of fresh agricultural commodities.

100

101 **SECTION 2 – SCOPE, USE OF DOCUMENT AND DEFINITIONS**

102

103 **2.1 Scope**

104

105 This Code covers food safety principles for the primary production, postharvest
106 operations, transport, and minimal processing of chilled young coconut water/drink as

107 defined in this Code, derived from young coconut, with or without the addition of tender
108 young coconut solid endosperm, potable water, and permitted sweeteners. Emphasis is
109 made on how to minimize contamination from microbiological hazards as they relate to
110 Good Agricultural Practice (GAP), Good Hygienic Practice (GHP) and Good
111 Manufacturing Practice (GMP).

112

113 **2.2 Use of the document**

114

115 The provisions of this document are supplemental to and must be used in conjunction
116 with, the Codex Recommended International Code of Practice-General Principles of
117 Food Hygiene (CAC/RCP 1-1969, Rev 4:2003), Revised Guidelines on Current Good
118 Manufacturing Practice in Manufacturing, Packing, Repacking, or Holding Food
119 (Department of Health Administrative Order No. 153 S. 2004) or its latest issuance and
120 Chilled young coconut water/drink – specifications (PNS/BAFPS 28:2006).

121

122 **2.3 Definitions**

123

124 **brix**

125 refers to concentration of sugar in syrup corresponding approximately to concentration
126 of solutes expressed in percentage as measured with a refractometer or hydrometer
127 and expressed in °Brix units

128

129 **chilling**

130 food preservation method in which the temperature is **controlled at** approximately 0-
131 5°C

132

133 **coconut meat**

134 tender solid endosperm obtained from young coconut

135

136 **contaminant**

137 refers to any substance not intentionally added to food which is present in such food as
138 a result of the production, postharvest handling, manufacturing, processing,
139 preparation, packaging, transport or holding of such food as a result of environmental
140 contamination

141

142 **food additives**

143 any substance not normally consumed as a food by itself and not normally used as a
144 typical ingredient of the food, whether or not it has nutritive value, the addition of
145 which to the food is intended for technological (including organoleptic) purpose in the
146 manufacture, processing, preparation, treatment, packing, packaging, transport or

147 holding of such food results, or may be reasonably expected to result, (directly or
148 indirectly) in it or its by-products becoming a component of or otherwise affecting the
149 characteristics of such foods. The term does not include contaminants, or substances
150 added to food for maintaining or improving nutritional qualities.

151

152 **good hygienic practices**

153 refer to all practices regarding the conditions and measures necessary to ensure the
154 safety and suitability of food at all stages of the food chain

155

156 **growers/agricultural workers**

157 person responsible for the growing and management of the *primary production of
158 coconut

159

160 **primary production**

161 steps involved in the growing and harvesting of coconut for example planting, irrigation,
162 application of fertilizers and application of agricultural chemicals.

163 **hazard**

164 refers to a biological, chemical or physical agent in food with a potential to cause
165 adverse effect on health

166

167 **labeling**

168 includes any written, printed or graphic matter that is present on the label, accompanies
169 the food, including that for the purpose of promoting its sale or disposal

170

171 **potable water**

172 water fit for human consumption and potability determined by health authorities cited
173 in Philippine National Standards for drinking water (Department of Health A.O. No.
174 2007-2013. Philippine National Standards for Drinking Water 2007)

175

176 **rancid odor**

177 off odor due to lipid oxidation (oxidative rancidity) and/or release of free fatty acids by
178 lipolysis (hydrolytic rancidity)

179

180 **sweeteners**

181 food additive that is used to impart a sweet taste to food or food products

182

183 **whole young coconuts**

184 young coconut with husk

185

186 **young coconut**

Draft Code of Hygienic Practice for Chilled Young Coconut water/drink

187 refers to 6-9 month old coconut (*Cocos nucifera* L.) from the time of flowering

188

189

190

191 SECTION 3 - PRIMARY PRODUCTION

192

193 These principles and guidelines supplement those contained in Section 3 of the Codex
194 Recommended International Code of Practice-General Principles of Food Hygiene
195 (CAC/RCP 1-1969, Rev 4:2003), Revised Guidelines on Current Good Manufacturing
196 Practice in Manufacturing, Packing, Repacking, or Holding Food (Department of Health
197 Administrative Order No. 153 S. 2004) or its latest issuance and Chilled young coconut
198 water/drink – specifications (PNS/BAFPS 28:2006).

199

200 PRINCIPLES APPLYING TO THE PRIMARY PRODUCTION OF COCONUT

201

202 Coconut water should not contain any contaminant at a level that compromises the
203 appropriate level of public health protection, when presented to the consumer. The
204 influence of primary production activities on the safety of coconut water/drink,
205 potential microbiological contamination from all sources should be minimized to the
206 greatest extent practicable. Microbiological hazards can be introduced from the farm
207 environment and farming practices, thus, relevant provisions of Good Agricultural
208 Practices (GAP) should be followed to assure food safety and prevent inappropriate
209 practices that may lead to unacceptable levels of contamination during primary
210 production.

211

212 3.1 Environmental Hygiene

213

214 Wherever possible, potential sources of contamination from the environment should be
215 identified. In particular, primary production should not be carried out in areas where
216 the presence of potentially harmful substances would lead to an unacceptable level of
217 such substances in or on coconut after harvest. For existing coconut production sites
218 that have shown potential for food safety risk, measures should be implemented to
219 minimize contamination.

220

221 Control measures involving treatment with chemical, physical or biological agents
222 should be undertaken with a thorough understanding of the potential hazards to health
223 and the environment. Such measures should be carried out in accordance with the
224 regular rules and recommendations of Fertilizer and Pesticide Authority (FPA).

225

226 3.1.1 Location of Coconut Production Site

227

228 For existing production sites that have shown potential for food safety risk, measures
229 should be implemented to minimize contamination. Wherever possible, potential

230 sources of contamination from the environment should be identified.

231

232 Fields should be regularly cleaned to minimize the spread of pests and diseases.
233 Diseased, senescent and dried part of the trees should be frequently removed, buried or
234 burned as these may harbor pests and diseases.

235

236 **3.2 Hygienic production of coconut**

237

238 **3.2.1 Pre-harvest selection of coconut and harvesting technique**

239

240 Only whole young coconuts shall be used for the product. Coconuts must be harvested
241 at 6-9 months of maturity to obtain maximum volume of water and ensure product
242 consistency. Harvest time is preferably during the cooler part of the day to minimize
243 deterioration at postharvest phase. High temperature at harvest will lead to more rapid
244 physiological changes and deterioration.

245

246 Harvesting operations and methods should be conducted with consideration on the
247 possible sources of contamination. Coconuts should not be allowed to fall to the ground
248 to prevent mechanical injury, as this will facilitate the entry of microorganisms, which
249 may cause spoilage of the coconut water within the coconut. As a common practice,
250 coconut bunches are lowered to the ground using a rope.

251

252 **3.2.2 Equipment Associated with Growing and Harvesting**

253

254 Standard Operating Procedures (SOPs) should be developed for the maintenance,
255 cleaning and disinfecting operations of growing and harvesting equipment. The
256 following are recommended:

- 257 • Cutting tools, implements, and equipment used to harvest coconuts should be
258 thoroughly cleaned before use and cutting edges should be kept smooth and
259 sharp; and
- 260 • Growers/agricultural workers should be trained to follow the SOPs.

261

262 Harvesting tools, collecting containers and other implements should be so designed and
263 constructed to ensure that they can be cleaned and maintained to avoid contamination.

264

265 **3.3 Handling and Storage**

266

267 Harvested coconuts should not come in direct contact with extraneous matter like dirt,
268 soil and chemical substances. If not properly washed off, these materials will introduce
269 chemical and microbiological contamination during coconut water collection.

270 At all times, harvested coconuts should be stored in a clean, well-ventilated area, off the
271 ground and away from direct sunlight. Likewise, coconuts should be stored in a way
272 which prevents them from rolling and cracking.

273

274 3.3.1 Prevention of Cross-Contamination

275

276 Coconuts are susceptible to damage during harvest and postharvest handling
277 operations. The following should be considered for the manual harvesting and
278 postharvest handling of coconuts:

279

- 280 • Evaluate the field for the presence of hazards or contamination prior to harvest;
- 281 • Train growers/agricultural workers to recognize and segregate damaged
282 coconuts;
- 283 • Practice good personal hygiene particularly during harvesting and field packing
284 operations;
- 285 • Provide harvest containers dedicated for coconuts;
- 286 • Avoid direct contact with the soil after harvest and before loading into a
287 transport vehicle to avoid contaminating the coconuts with microbiological
288 contaminants in the soil;
- 289 • Avoid mechanical damage such as cracks, as these may provide entry points for
290 foodborne pathogens and sites for microbiological survival and multiplication;
291 and
- 292 • Collect and dispose damaged coconuts immediately so that they will not attract
293 animals and insect pests.

294

295 3.4 Transport from the Production Site to the Packing/Processing Facility

296 **Coconuts being actively respiring after harvest should be protected from direct sunlight**
297 **during transport. Covers may be placed on open transport trailers if deemed necessary.**

298 Coconuts are also **at risk** to mechanical damage during loading, unloading and
299 transportation. Care must be taken to avoid cracking during handling and
300 transportation. Coconuts must be loaded in a manner that prevents them from cracking
301 during transportation. Rolling of coconuts should be avoided.

302 The following should also be considered:

- 303 • Transportation of coconuts should be managed to reduce or control the risk of
304 contamination.
- 305 • Separate coconuts from other agricultural products during transport.
- 306 • Vehicle for transporting the coconut should be **adequate for the purpose and**
307 **should be** cleaned and maintained as not to constitute a source of contamination
308 to the coconut.

- 309 • When not in use, cleaned harvest containers and transport trailers should be
310 covered and kept in a protected location.
- 311 • Replace damaged containers or transport trailers.

312

313 **SECTION 4 - ESTABLISHMENT: DESIGN AND FACILITIES**

314

315 **4.1 Plant Constructions and Layout**

316

317 **4.1.1 Location, size and sanitary design**

318

319 The buildings and surrounding area:

- 320 • should be located in a flood-free area and of considerable distance from possible
321 source of contamination;
- 322 • should be kept reasonably free from objectionable odours, smoke, dust, or other
323 contamination;
- 324 • should be of sufficient size for the purpose intended without crowding of
325 equipment or personnel;
- 326 • should be of sound construction and kept in good repair;
- 327 • should be of such construction as to protect against the entrance and harbouring
328 of insects, birds or vermin and environmental contaminants such as dust, smoke
329 and the like;
- 330 • should be designed as to permit easy and adequate cleaning; and
- 331 • should be designed to provide separation, by partition, location or other effective
332 means between operations, which may cause cross contamination.

333

334 Floors should be constructed of material, which is not capable of supporting microbial
335 growth, and should be hard surfaced. They should be designed to facilitate effective
336 cleaning.

337

338 Walls and ceiling should be so designed, constructed and finished as to prevent the
339 accumulation of dirt and minimize condensation, mold development and flaking and
340 should be easy to clean.

341

342 Doors should be self-closing and close fitting.

343

344 **4.1.2 Sanitary facilities and control**

345 The following are the considerations:

- 346 • The water supply should be of potable quality.

- 347 • Disposal of waste should be effected in such a manner so as to prevent
348 contamination of potable water supplies.
- 349 • Premises should be well lit and ventilated. Good ventilation is important to
350 prevent mould growth.
- 351 • Light bulbs and fixtures suspended over food in any step of preparation should
352 be of the safety type or otherwise protected to prevent food contamination in the
353 case of breakage.
- 354 • Toilet rooms should be well lit and ventilated and should not open directly into a
355 food processing area. They should be kept in a sanitary condition at all times.
356 There should be hand washing facilities in the toilet area with signages requiring
357 personnel to wash their hands properly.

358

359 **SECTION 5 - CONTROL OF OPERATION**

360

361 These principles and guidelines are supplemental to those contained in Section 5 of the
362 General Principles of Food Hygiene (CAC/RCP 1-1969) including the Annex on Hazard
363 Analysis and Critical Control Point (HACCP) System and Guidelines for its Application.
364

365 **5.1 Key aspects of hygiene control systems**

366

367 **5.1.1 Temperature and time controls**

368

369 Coconut water/drink should be cooled immediately after collection to slow down the
370 onset of degradation. Coconut water/drink retains its quality characteristic under
371 conditions of low temperature at about 4⁰C. Coconut water/drink undergoes spoilage
372 on storage at higher temperature over extended period of time.
373

374 **5.1.2 Specific Process Steps**

375

376 **5.1.2.1 Removal of unfit coconut**

377

378 Coconuts characterized by the following must be rejected and must not be included as
379 raw source of coconut water/drink:

- 380 • Coconuts with presence of cracks;
 - 381 • Coconuts with pedicels not intact;
 - 382 • Any degree of pest infestation;
 - 383 • Coconuts that are either pre-mature or over-mature;
 - 384 • Coconuts with contents that are cloudy; and
 - 385 • Coconuts with contents having a rancid odor
- 386

387 **5.1.2.2 Coconut sanitation**

388

389 Coconuts should be washed thoroughly to remove adhering extraneous matter using
390 manual cleaning or by using brushes and abrasive pads. Washed coconuts should be
391 sanitized in dilute bleach solution (1 tablespoon bleach per 4.5 liters of water) to reduce
392 the number of microorganisms on the surface of coconut. Sanitized coconuts should be
393 transferred to a clean surface off the ground and allowed to air dry.

394

395 If using a basin, water used during washing should be frequently changed especially
396 when there is high level of soil contamination.

397

398 Washed coconuts should be processed immediately after washing.

399

400 **5.1.2.3 Coconut water collection, filtration and cooling**

401

402 Coconuts should be cut on a cutting board using a sanitized cutlass or similar tool.
403 Equipment, containers or any other collecting vessels used should be made from non-
404 toxic materials. They should be designed and constructed to ensure that, they can be
405 cleaned, disinfected and maintained to avoid the contamination. They should be kept
406 sanitary through regular cleaning. Containers previously used for toxic materials shall
407 not be used for holding extracted coconut water.

408

409 Coconut water should be filtered using appropriate filtering material like cheese cloth
410 and strainer. Collected coconut water may be filtered by decanting it into a sanitized
411 container with a strainer lined with sanitized silkscreen cloth or cheesecloth. The filter
412 cloth should be changed as deemed necessary.

413

414 Filtered coconut water should be immediately cooled to 4°C temperature or processed,
415 packed and stored at about 4°C temperature.

416

417 Coconut water that are cloudy and exhibiting a rancid odor should be disposed properly
418 and should not be mixed with the other coconut water.

419

420 **5.1.2.4 Formulation of coconut water/drink**

421

422 According to PNS/BAFPS 28-2006: specification for chilled young coconut water/drink,
423 the products is classified as follows:

424

Classification	Description
100% buko juice	Unmodified natural aqueous liquid of 6-9

	month-old coconut, the appearance of which ranges from clear to slightly turbid
Buko juice with tender solid endosperm	Buko juice with the addition of tender solid endosperm from 6 to 8 month-old coconut
Buko juice drink – buko juice with water, with or without sweetener, without tender solid endosperm	Buko juice with the addition of potable water, with or without permitted sweeteners and without tender solid endosperm. Addition of potable water is no more than 20%
Buko juice drink – buko juice with water, with or without sweetener and with tender solid endosperm	Buko juice with the addition of potable water, with or without permitted sweetener and with tender solid endosperm from 6 to 8 month-old coconuts. Addition of potable water is no more than 20%

425

426 **5.1.2.5 Packaging**

427

428 Chilled young coconut water/drink, with or without addition of water, sweetener
 429 and/or tender solid endosperm, should be immediately packed in a food grade
 430 container that will adequately protect the product from contamination and hazards of
 431 transportation and handling. Packed coconut water/drink should be sealed and
 432 transferred rapidly to a chiller or similar container maintained at 4°C.

433

434 Packaging materials shall be food grade and suitable for intended use. This should be
 435 stored in a clean and sanitary manner. Packaging activities should be done in a separate
 436 room under conditions that preclude the introduction of contaminants into the product.
 437 All workers and food handlers should follow practices as in the appropriate sections of
 438 the Codex Recommended International Code of Practice-General Principles of Food
 439 Hygiene (CAC/RCP 1-1969, Rev 4:2003) to avoid contamination.

440

441 **5.2 Handling, Storage and Transport**

442

443 Packaged coconut water/drink should be stored away from direct light. Temperature
 444 should be maintained **at a maximum of 4°C** during storage, transport and distribution.

445 **5.3 Processing environment**

446

447 The processing environment for coconut water must be clean and free of animals,
448 insect, dusts and garbage. All surfaces coming in direct contact with coconut
449 water/drink must be properly cleaned and sanitized. Waste material (e.g. coconut husk)
450 must be removed and disposed **immediately**.

451

452 **5.4 Management of products within the facility**

453

454 The principle of “first in, first out (FIFO)” should apply. The flow of product within the
455 equipment and through the processing facility should maintain a forward progression
456 from the raw material to coconut water/drink packaging so as to avoid cross
457 contamination.

458

459 **5.5 Documentation and record keeping**

460

461 Where appropriate, records should be maintained to adequately reflect product
462 information. Maintaining adequate documentation and records of processing
463 information is important in the event of recall of chilled young coconut water/drink.
464 Records should be kept long enough to facilitate recalls and foodborne illness
465 investigations.

466

467 Records should be kept on the:

- 468 • Use of agricultural chemicals;
- 469 • Date and time of harvest of coconut;
- 470 • Volume of coconut water collected;
- 471 • Date and time of processing;
- 472 • Amount of water, sweetener and solid endosperm added (if applicable);
- 473 • Volume of production, and;
- 474 • Storage condition

475

476 **5.6 Recall procedures**

477

478 In the event of a foodborne illness outbreak associated with coconuts, maintaining
479 appropriate records of production, processing, packaging and distribution may help to
480 identify the source of contamination in chilled young coconut water/drink food chain
481 and facilitate product recalls. Growers/processors/distributors should consider
482 developing and maintaining a traceability/product tracing system. The
483 traceability/product tracing system should be designed and implemented according to
484 the principles for Traceability/Product Tracing as a Tool with Food Inspection and
485 Certification System (CAC/GL 60-2006).

486

487 Detailed records should be kept that will link each supplier of the product with the
488 immediate subsequent recipient of the product throughout the food chain.

489

490 **SECTION 6 – ESTABLISHMENT: MAINTENANCE AND SANITATION**

491

492 **6.1 Maintenance and Cleaning**

493

494 **6.1.1 General**

495

496 All food contact surfaces should be smooth; free from pits, crevices and loose scale; non-
497 toxic; resistant to corrosion and capable of withstanding repeated exposure to normal
498 cleaning and disinfection; and non-absorbent unless the nature of a particular and
499 otherwise acceptable process renders the use of a surface, such as wood, necessary.

500

501 All equipment coming in direct contact with coconut water should be cleaned and
502 sanitized before and after use. There should be regular cleaning schedule for all
503 equipment and food contact materials used during processing.

504

505 **6.1.2 Pests Control Systems**

506 Pests should be controlled in a way that does not contribute to the contamination of the
507 raw materials, finished produce or the processing area with chemical residues. Suitable
508 precautions should be taken to protect product from being contaminated by pests or by
509 pest control agents.

510

511 **6.1.3 Drainage and Waste Disposal**

512

513 Adequate drainage is important in the processing and sanitary facilities to avoid the risk
514 of contaminating the coconut water/drink. Drains should be cleaned periodically to
515 prevent build-up of biofilms that may contain pathogenic microorganisms. Standing
516 water should be removed or pushed to the drains.

517

518 Areas for garbage recyclables and compostable waste should be identified and all waste
519 should be stored and disposed in a manner to minimize contamination.

520

521 **6.2 Sanitary Audit**

522

523 Regular environmental and hygiene assessment as well as sanitary inspection of
524 facilities should be conducted to serve as basis for corrective and preventive actions.

525

526 **SECTION 7 - PERSONAL HYGIENE**

527

528 All workers and food handlers should act in accordance with the appropriate sections of
529 the Recommended International Code of Practice – General Principles of Food Hygiene
530 (CAC/RCP 1 – 1969) to maintain an appropriate degree of personal cleanliness; and
531 operate in an appropriate manner.

532

533 Contamination of coconut water/drink by human must be avoided at all times. All
534 individuals involved in the primary processing must be in good health and must observe
535 Good Hygienic Practices (GHP) in order to prevent contamination of the product during
536 coconut water collection and packaging.

537

538 **SECTION 8 - END PRODUCT SPECIFICATION**

539

540 Coconut water/drink should be clean, sound, wholesome product derived from young
541 coconut, with or without addition of tender young coconut solid endosperm, potable
542 water, and permitted sweeteners. To the extent possible in good manufacturing practice
543 (GMP), the product should be free from extraneous matter.

544

545 The product should conform with heavy metals in an amount not hazardous to human
546 health. The product should not contain pathogenic microorganisms such as Salmonellae
547 and E. coli and should conform to the microbiological characteristics specified in
548 Philippine National Standard for Chilled young coconut water/drink (PNS/BAFPS
549 28:2006).

550

551 **SECTION 9 - PRODUCT INFORMATION AND CONSUMER AWARENESS**

552

553 **9.1 Labeling**

554

555 Coconut water/drink should be labeled in accordance with the Current FDA labeling
556 requirements for Pre-packaged Food Products. Labels must be printed legibly in
557 accordance to the FDA labeling guidelines in order to assure their adherence to the
558 product during storage on ice or refrigeration.

559

560 **SECTION 10 – TRAINING**

561 Training should be conducted regularly and in accordance to hygienic practices.
562 Training should be delivered in a language and manner to facilitate understanding of
563 what is expected of them and why should training be done with emphasis on the
564 importance of using hygienic practices.

565

566

567

568 **REFERENCES:**

569 CAC/RCP 57-2004. Code of hygienic practice for milk and milk products.

570

571 CAC/RCP 23-1979. Code of hygienic practice for low and acidified low acid canned
572 foods.

573

574 CAC/RCP 1-1969. General principles of food hygiene.

575

576 Magat, S. 2006. Philippine Coconut Authority: Good Agricultural Practices in Coconut
577 Production .

578

579 PNS/BAFPS 28:2006. Chilled young coconut water/drink – specification.

580

581 Prades, A., Dornier, M., Nafissatou, D., and Pain, J.P. 2012. Coconut water preservation
582 and processing: A Review.

583

584 Rolle, R. 2007. Good practice for the small-scale production of bottled coconut water.
585 Food and Agriculture Organization of the United Nation.

586

587 Department of Health. Administrative Order No. 153 S. 2004: Revised Guidelines on
588 Current Good Manufacturing Practice in manufacturing, Packing, Repacking, or Holding
589 Food.

590

591

592

593

594

595

**TECHNICAL WORKING GROUP (TWG) FOR THE DEVELOPMENT OF
THE PHILIPPINE NATIONAL STANDARD (PNS) CODE OF HYGIENIC
PRACTICE (COHP) FOR COCONUT SAP SUGAR**

Chairperson:

Karen Kristine A. Roscom

OIC Executive Director

Bureau of Agriculture and Fisheries Standards (BAFS)

Members:

Ms. Josephine T. Nieva Philippine Coconut Authority (PCA)

Ms. Fria Lauren M. Jadulang Philippine Coconut Authority (PCA)

Ms. Joanna L. Mari Freo Philippine Coconut Authority (PCA)

Ms. Teresita S. Palomares Industrial Technology
Development Institute (ITDI)

Ms. Una Grace M. Dollete Industrial Technology
Development Institute (ITDI)

Ms. Maria Theresa C. Cerbolles Food and Drug Administration
(FDA)

Ms. Yvonne V. Agustin United Coconut Association of the
Philippines (UCAP)

Ms. Vermelyn O. Evangelista Philippine Coconut Research and
Development Foundation Inc.
(PCRDF)

Technical Secretariat:

Ms. Mary Grace R. Mandigma / Ms. Lara Vivas-Navarro, BAFS

Ms. Katrina L. Maminta / Ms. Farlash D. Pancho, BAFS

596

597

