

HACCP PLAN FOR GREEN TEA PRODUCT OF PT GT AND ITS IMPLEMENTATION

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ABSTRACT

HACCP plan for green tea product of PT GT is established in this research. The scope of the study covers the production process starting from receiving raw material at the factory until the packaging step. Determination of Critical Control Point(s) (CCPs) refers to the decision tree in CAC(2003). Critical Control Points in green tea production in PT GT lay on the final drying by ball tea and the sorting process based on density by section winnower. Critical limits in the first CCP are ball tea temperature ranging from 100 to 150°C, mass of tea leaves in a batch is 600 kg for grade A and 550 kg for grade B, and the drying time ranging from 8 to 10 hours. The critical limit in the second CCP is no metal component detected by the final metal detector at section winnower. An audit has been carried out to verify the implementation of the HACCP plan. Based on the audit, the CCP monitoring and corrective action form that has been arranged needed some correction so that the operator and supervisor will be able to fill the form better. **Key words:** HACCP, green tea, Critical Control Point(s), critical limit, audit Reference: 11 (1995-2009).

PREFACE

Background

Food industries are encountering many challenges, especially in the case of food safety. Some of the challenges are the increasing number of new food pathogens; chemical contamination of food which can be caused by the usage of non permitted food additives or comes from antibiotic residue, pesticide residue, and excessive usage of disinfectant; and the remarkable growth of food products and processes diversity, so the effort needed to ensure food safety also increases. In addition to that, the international trade demands for

worldwide equivalence of food safety. Therefore, a **food** industry that wants its products to be constantly safe **and** survive in the international trade **must** implement international food safety standard as **well**.

HACCP (Hazard **Analysis** Critical Control **Point(s)**) is a system adopted by **Codex Alimentarius** Commission as an international food safety standard. In the beginning, HACCP is **adopted** by **FDA (Food and Drug Administration)** from a program developed in the 1960s as a **system** to ensure **the** safety of food for astronauts. **At** that time, the food safety **control system** in food industries commonly depended on final product testing which could not assure thorough food safety. Therefore, the food safety system adopted by FDA, which **is** now known as HACCP, is implemented in food industries. **This system is proactive and focuses on preventing hazard in the entire process chain, starts from raw material until finished product, according to its initial concept.** This method is far **more efficient** than the traditional method, which rely **on** final product **testing**, because **every** point at which there is any **possibility of hazard** occurrence is controlled strictly. This preventive **system also** gives advantage to food **industries** in which **it can reduce waste.**

The **implementation** of HACCP in this research is focused **on green tea product of PT GT.** PT GT is a food industry that **manufactures** some tea products, including black tea, **green tea, and white tea.** **The** products are distributed not only in Indonesia, but also in other countries, thus making the **implementation** of HACCP in PT GT is crucial.

Objective

The general objectives of this research are to **design** and implement HACCP for **green tea product of PT GT.** *The* specific **objectives** of this research are **to produce** a HACCP plan for green tea product of PT GT **and** to observe its implementation through an audit.

METHODOLOGY

The method used in this research is qualitative descriptive method. The **types of data that want** to be obtained are primary data, secondary data, and tertiary data. **The** methods used to obtain

primary data include conduct direct surveys to the factory, observe the production process of green tea starting from raw material receiving **until** the **packaging** stage of final product, **observe** the Standard Operating Procedures (SOP] which are implemented in PT GT, and interview the staffs and employees in PT GT. The methods used to obtain secondary data include literature review, especially on the subject **of HACCP and** production process of green tea, **and** collection of data from the industry. The method used to obtain tertiary data is conducting literature review of national and international standard. The following steps are completed to process the data:

- 1) develop a questionnaire which can accommodate the data collection,
- 2) develop a HACCP team and determine the scope of the study,
- 3) describe the product,
- 4) identify the product's intended use,
- 5) draw up a detailed flow diagram of green tea production **conducted** in PT GT,
- 6) verify the flow diagram on-site,
- 7) identify and analyze hazards,
- 8) determine the Critical Control Point(s) (CCPs),
- 9) establish critical limits for **each** CCP,
- 10) determine monitoring procedure,
- 11) determine corrective action,
- 12) develop **monitoring** CCPs and corrective action forms,
- 13) implement **HACCP** in the production process of green tea in PT GT,
- 14) verify the implementation by conducting an audit.

RESULT AND DISCUSSION

Scope of the Study

Scope	<ol style="list-style-type: none"> 1. A food safety management system for green tea product. 2. This system <i>covers</i> the production process starting from receiving of tea leaves at the factory until the packaging of final product.*
HACCP Objective	<ol style="list-style-type: none"> 1. Ensure the safety of green tea product. 2. Ensure that the quality of green tea product complies with the international standard. 3. Increase consumer's trust. 4. Enhance the employees' knowledge about the product handling and safety.

***Note:** The storage of green tea product is not **included** in this system because generally the **products** are delivered to the consumer right after they are produced **Excess** of production is usually happened **only** in raining season.

Product Description

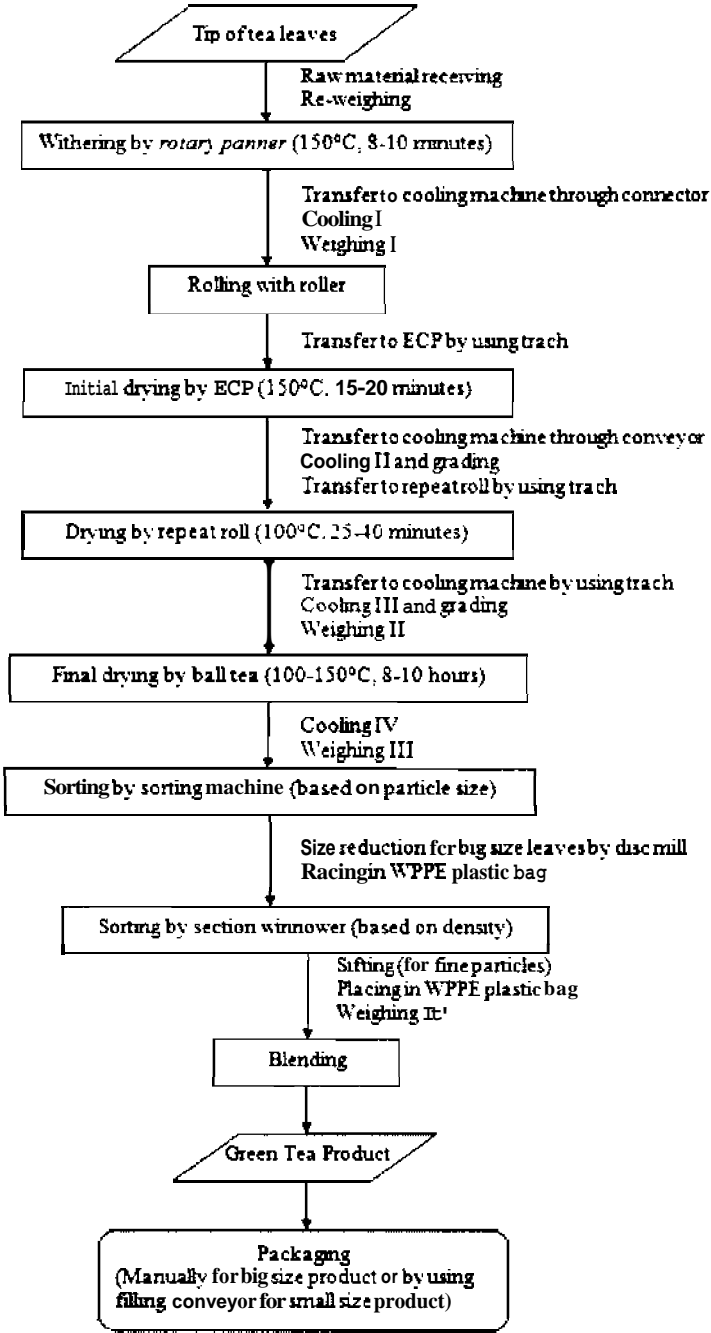
Product name	Green tea
Physical and chemical properties	<p>According to SNI-01-3945-1995 : Appearance of tea (dry) Color : greenish black (B) Form : rolled/twisted (B) Aroma : normal (A) Texture : solid (A) Size uniformity : uniform (B) Foreign material : none (A) Conclusion : good (B) Water extract Color ; greenish yellow (SNI 01-3945-1995 : red and bright (4)) Taste : between good and very good (43) Residue Appearance : green (SNI 01-3945-1995 : bright and coppery (b)) Result : 43/B/4/b {according to SNI of Green Tea (SNI 01-3945-1995)} aw = 0.523 Moisture content = 3-7% pH water extract = 5.30</p>
Preservation method	Gradually dried until moisture content reaches 3-7%

Packaging method	By using paper sack [with aluminium foiling inside), Woven Plastic Polyethylene (WPPE) single plastic bag, WPPE double plastic bag, WPPE single and double plastic bag with High Density Polyethylene (HDPE) inner liner
Storage condition	No specific requirement, but should be avoided from direct sunlight and kept in a dry and clean place.
Distribution method	By using open-top truck which is covered by tarpaulin.
Shelf life	2 years from the manufacturing date
Specific requirement in labeling	None
Preparation and usage by consumer	Can be consumed directly by boiling it in water or can be further processed to produce aromatic tea (for example jasmine tea), packed tea drink, and extract.

Product's Intended Use

Target	This green tea product can be consumed by male and female, all age , and commonly is further processed by jasmine tea factory, beverage factory, extraction factory
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Flow Diagram of Production Process of Green Tea in PT GT and The Critical Control Points (CCPs)



CCPs	Hazard	Critical Limits	Monitoring Procedure	Corrective Action	Verification Procedure	Record Keeping
Final drying by ball tea	Mold (includes <i>Aspergillus</i> species with known capacity for ochratoxin A and aflatoxin production) (Mabbett, 2008)	Ball tea temperature = 100-150oC	What : Ball tea temperature How: Periodical inspection of thermostat Where: ECP and ball tea room When : Every hour for each batch of final drying Who : Operator ECP + BT and Supervisor ECP + BT	<ul style="list-style-type: none"> - Contact the operator of wooden fuel to manage the wood filling so that ball tea temperature reaches 100-150oC - Final drying time is adjusted according to the condition of final product 	Laboratory testing of the presence of mold (especially <i>Aspergillus</i>), Evaluation of "Record of Ball Tea Temperature Inspection and Corrective Action", Evaluation of "Record of Final Drying Inspection and Corrective Action"	Microbiology test result in laboratory, Record of Ball Tea Temperature Inspection and Corrective Action, Record of Final Drying Inspection and Corrective Action
		Weight of tea leaves dried in ball tea for each batch - 600 kg (grade A), 550 kg (grade B); Drying time = 8-10 hours	What : Weight of tea leaves for each batch, drying time How: Monitoring of weighing tea leaves and calculation of final drying time Where : ECP and ball tea room When : Before and after final drying (for each batch) Who : Operator ECP + BT and Supervisor ECP + BT	<ul style="list-style-type: none"> - Re-weigh - Check the balance which is used in weighing - Check the condition of the final product (final drying time is adjusted according to the condition of final product) 		

<p>winnower (based on density)</p>	<p>Metal component from roller, ECP, and disc mill</p>	<p>No metal component detected by the final metal detector at section winnower</p>	<p>What : Metal component at the final metal detector of section winnower How: Visual inspection Where : Sorting room When : After sorting by section winnower (for each batch) Who : Sorting Operator and Sorting Supervisor</p>	<p>- Check the efficiency of metal detector at the section winnower - Adjust the distance between metal detector and the conveyor of section winnower according to magnetic power of the metal detector - Processed tea is passed through the metal detector again</p>	<p>Testing of all metal detector every week, Evaluation of "Record of Metal Detector Inspection and Corrective Action"</p>	<p>Record of Metal Detector Testing, Record of Metal Detector Inspection and Corrective Action</p>
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Audit Result toward HACCP Implementation for Green Tea Product of PT GT

After the development of HACCP plan for green tea product of PT CT, the factory has tried to implement the HACCP plan for about 2 weeks. The implementation is specific to CCP 1 (final drying by ball tea). The implementation was then audited and evaluated in order to improve the HACCP plan. Based on the audit result, the HACCP plan has been implemented by PT GT, but the CCP monitoring and corrective action form that has been arranged needed some correction so that the operator and supervisor will be able to fill the form better.

CONCLUSION

Based on the HACCP plan, it can be concluded that there are **two** Critical Control Points (CCPs) in the production process of green tea in PT GT. The first CCP is the final drying by ball tea, which is used to control the biological hazard, i.e. mold, including *Aspergillus* species with known capacity for ochratoxin A and aflatoxin production. The second CCP is the sorting process based on density by section winnower, which is used to control physical hazard, i.e. metal component from roller, ECP, and disc mill. The audit on the implementation of CCP 1 showed that the CCP monitoring and corrective action that has been arranged needed some correction so that the operator and supervisor will be able to fill the form better.

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