



**Uva Wellassa University**  
**Faculty of Animal Science & Export Agriculture**

**B.Sc in Tea Technology & Value Addition**

**End Semester Examination – Feb/March 2012**

**Year IV Semester I**

**Quality Control & Assurance (TEA 433-3)**



**Instructions**

**Answer all questions.**

No. of questions : Four (04)

No. of pages : Four (04)

Time : 02 hours

Total marks allocated : 70%

Index No : .....

**PART II – Essay**

**Question 01**

Assume that you are a member of a HACCP team studying the preparation and production of smoked bacon and avocado tossed green salad for chilled retail sale. Your team has begun with microbiological hazards. You should assume that your premises comply with current legal requirements.

This product is pre-packed and includes sachets of croutons and dressing to be applied by the consumer immediately prior to consumption.

The product is made at a small manufacturing site with good standards of building finish and equipment. The products are for high street retailers who sell them as part of their snack lunch range. All salad products are made in a dedicated department but the trade is seasonal necessitating the use of temporary personnel who, ideally, should have food hygiene training. Occasionally personnel are employed untrained. Induction for all personnel includes instruction on hand washing procedures.

Ingredients for the salad are delivered to the site by suppliers. Smoked bacon is supplied by a local butcher who de-rinds it and slices it manually. As the butcher is very local, the bacon is frequently delivered personally in his van and then put into chilled storage prior to use. All salad materials are stored in a vegetable store at approximately 10°C.

The bacon is lightly grilled, cooled to room temperature and diced by hand, then covered and stored on a table in the preparation area. The diced bacon, in addition to use in the salad, is also used for the preparation of pastry and sandwich fillings.

Lettuce leaves are washed and drained. The avocado pears are peeled and sliced manually, then dipped in citric acid to preserve their colour, along side the banana and apple for the fruit salad dessert.

The bacon, lettuce and avocado are weighed out individually into batch requirements and are then placed in a large plastic tray where they are tossed together by hand with freshly milled sea salt and freshly ground black pepper before being hand packed into clear plastic trays with the sachets of dressing and croutons.

The salad products are then gas flushed with nitrogen & carbon dioxide, lid applied and sealed. Desserts and pastry products are packed in plastic trays with snap on lids. All packs are labeled and coded (the salads have a 2 day shelf life) before being stores and distributed at less than 5°C.

The scope of this HACCP study is contamination of the salad with high levels of *Staphylococcus aureus* and hence its toxin.

- I. Construct a process flow diagram from the information provided for the preparation, packing and distribution of smoked bacon and avocado tossed green salad.
- II. Bearing in mind the scope of the study, identify one hazard and its source for each of the following process steps by completing the table below.

Process step	Hazard and its source
(a) Bacon – light grilling	
(b) Peeling avocado pears	
(c) Packing	

- III. Suggest one control/ preventative measure for each hazard identified in the following process steps (complete the table)

Process step	Hazard and its source	Control/ preventative measure
(a) Storage of uncooked bacon	Toxin formation due to growth of <i>S.aureus</i>	
(b) Gas flushing	Growth of <i>S.aureus</i> due to insufficient carbon dioxide	

III. Apply the HACCP decision tree to the following process steps.

Process step	Hazard	Control/preventative measure	Decision Tree questions (put Yes or No as appropriate)					CCP Y/N
			1	1a	2	3	4	
(a) Incoming bacon	<i>S.aureus</i> contamination due to poor practices by butcher	Cooking of bacon before assembly						
(b) Assembly of salad ingredients	Contamination of product with <i>S.aureus</i> by handler	Hygiene training of food handlers						
(c) Finished product storage	Growth of <i>S.aureus</i>	Chilled storage						

(100 Marks)

**Question 02**

“Attention to good hygienic design and construction, appropriate location, and the provision of adequate facilities, is necessary to enable hazards to be effectively controlled”.

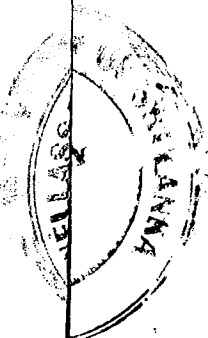
Discuss on it with the appropriate examples.

(100 Marks)

**Question 03**

Assume that you are a Quality Assurance manager of a salad factory.

On one of your regular visits to the production line, you notice that one of the operatives involved in mixing and tossing the salad has a rash on her hands. On investigation, the operator said that she thought it had started the previous evening.



During discussion, the shift manager suggested the following actions;

- a. Stop the operator working on open food handling work.
- b. Destroy previously made product
- c. Complete a full clean down before restarting production
- d. Remake the days order
- e. Record the incident

Bearing in mind the scope of the study and the information given, briefly comment on each of these suggestions. Include any alternative or additional actions you consider necessary.

**(100 Marks)**

#### **Question 04**

“Equitable development which meets the needs of the living population & the future generations in harmony with the global resources availability & nature’s carrying capacity”. Discuss on it with justifications.

**(100 Marks)**