

# Evaluation of the practices applied in the preparation of vegetable salads in a catering unit

A. Rodrigues<sup>1</sup>, E. L. Pereira<sup>1,2</sup> and E. Ramalhosa<sup>1,2</sup>

<sup>1</sup>School of Agriculture, Polytechnic Institute of Bragança, Campus Sta. Apolónia, Apartado 1172, 5301-855 Bragança, Portugal

<sup>2</sup>Mountain Research Center (CIMO), Polytechnic Institute of Bragança, School of Agriculture, Campus Sta. Apolónia, Apartado 1172, 5301-855 Bragança, Portugal  
elsa@ipb.pt

## Introduction

Nowadays, a diet rich in fruits and vegetables is highly recommended, as their consumption can decrease the risk of incidence of some diseases.

Consumers demand for ready-to-eat meals and use more often catering units. In these establishments, salads must be prepared with some care. Such products are often eaten raw or with minimal processing and if contaminated with pathogenic microbes, may represent a health hazard to the consumers.

In Europe great efforts have been made to produce legislation that improves food hygiene and render the Hazard Analysis and Critical Control Points (HACCP) system mandatory (EC Regulation n.º 852/2004, EC Regulation n.º 853/2004). Nevertheless, even if sometimes this system is implemented, several lacks on the practices might be found.

## Objective

Evaluation of the attitudes and practices of the food handlers who are routinely involved in salad preparation in a catering unit although in this organization an HACCP plan is implemented.

## Results and Discussion

In general terms, the practices followed in the reception, storage and preparation were quite satisfactory, whereas some points needed correction.

### A) Vegetables reception

- Vegetables proceed from only one supplier and are frequently received on Mondays from 9h:10 to 11h:13;
- Vegetables received: onions, lettuce, tomatoes and carrots;
- Transportation vehicle: station wagon (opening box covered with a tilt – 27%; closed unrefrigerated vehicle – 64%; refrigerated car – 9%). In all situations the transport vehicle was at room temperature;
- The store keeper always recorded the quality of the raw-materials ⇒ **36.4%** of the visits, **absence of labeling** was observed.

### B) Vegetables storage

- Reception/storage time: 1 to 16 minutes;
- Products stored at room temperature (ex. onions) or under refrigeration (6.2±0.5°C) (ex. lettuce, tomatoes, carrots);
- Refrigeration chamber is clean, in good maintenance state and tidy up;
- Manual register of temperatures: twice a day.

### C) Salads preparation

- Salads were always prepared in a specific zone: “Preparation Zone of Legumes and Salads”;
- The exposition time of the vegetables since their entrance in the kitchen until the beginning of their preparation is indicated in Table 1.

Table 1 – Exposition time (min) of the vegetables.

	Turn A		Turn B	
	Morning	Afternoon	Morning	Afternoon
Average±SDV	46±19	49±18	34±18	46±28
Minimum	20	20	2	15
Maximum	68	68	53	100

↩ Needs improvement

- In relation to salads preparation, the food handlers finished the task in a variable time (Table 2).

Table 2 – Total time (min) spent during salads preparation.

	Turn A		Turn B	
	Morning	Afternoon	Morning	Afternoon
Average±SDV	48±36	36±10	50±13	39±8
Minimum	30	21	32	21
Maximum	66	51	67	54

- The disinfection methods varied within turns:

Turn A - Chlorine-tablet  
- Vinegar

Turn B - Chlorine-tablet

The correct procedute was not always followed ⇒ **Lack of specific training and empiric adoption of safe attitudes and behaviors**



## Materials and Methods

- Catering unit located in the Northeast of Portugal: labor 10 months per year and serves up around 970 meals daily. An HACCP plan is implemented;
- Salads are prepared twice a day;
- The practices were followed *in loco*, using a check-list. The following topics were evaluated:
  - (i) Vegetables reception;
  - (ii) Vegetables storage;
  - (iii) Salads preparation;
  - (iv) Salads distribution;
  - (v) Fulfillment of the Washing and Disinfection Plan;
  - (vi) Check of the execution of the Good Practices on Personal Hygiene.
- Study period: May to November 2009 (21 periodic visits).

### D) Salads distribution

- Unrefrigerated display cabinet.
- Exposition time varied between 1h30 to 3h30 ⇒ **Critical zone of temperatures**

### E) Fulfillment of the Washing and Disinfection Plan

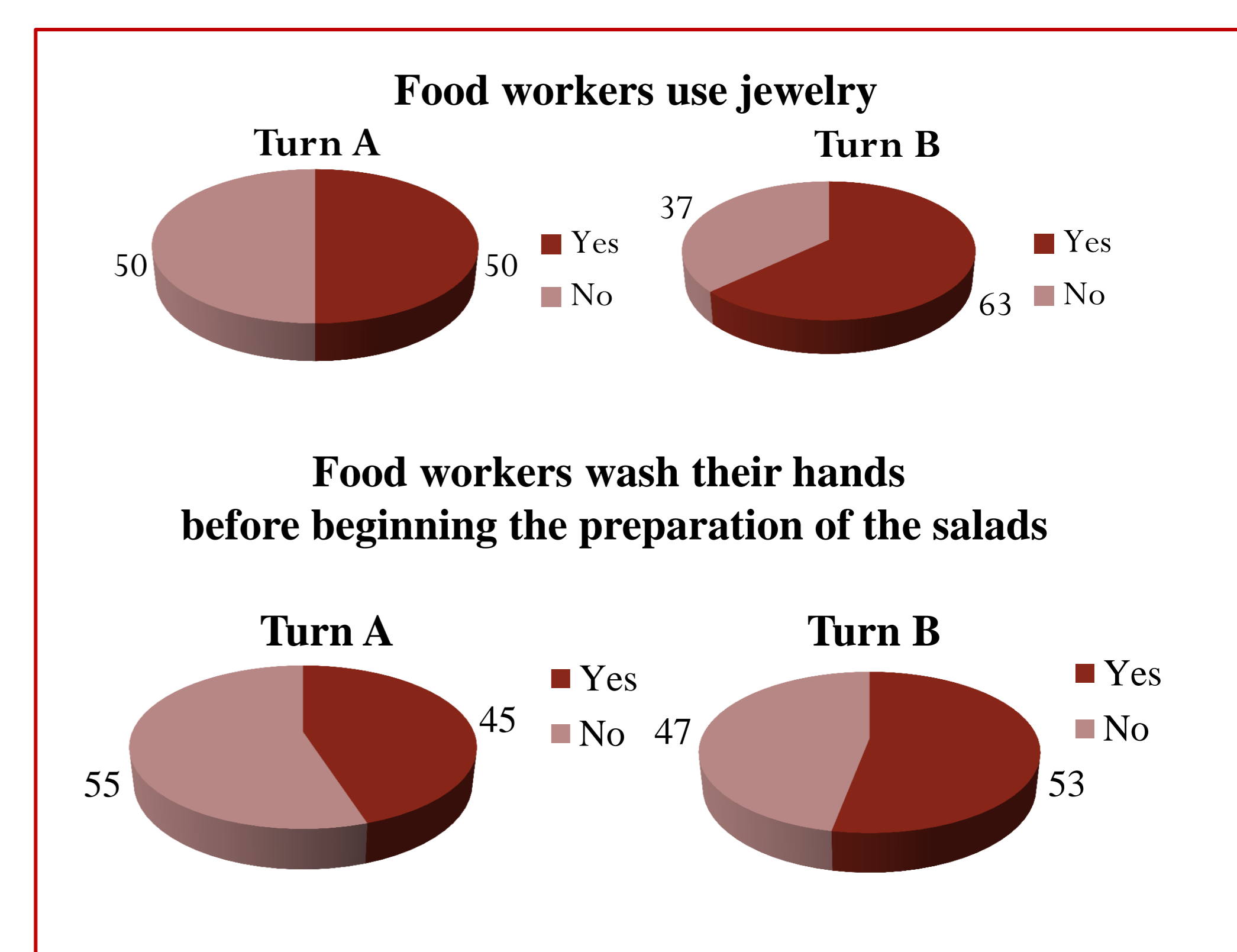
- Disinfectant/bactericide Carvidet® and Mistolin DLB-B® (bio-alcohol): 81.8% In Turn A and 36.8% in Turn B;
- Washing and Disinfection Plan - implemented but sometimes the records had not been done ⇒ **Practice that needs correction**;

### F) Check of the execution of the Good Practices on Personal Hygiene

#### Positive points

- Uniform: always tidy and clean;
- Waste bin: with cover and pedal, and coated with a plastic bag;
- Food handlers: did not go to WC during the task.

#### Negative points



## Conclusions / Recommendations

- The practices followed in vegetable salads preparation in a catering unit were quite satisfactory;
- Even an HACCP plan is implemented some aspects need to be improved;
- There is a need of finding alternative educational strategies that must be better understood by the food handlers.