15TH WORLD CONGRESS ON ENVIRONMENTAL HEALTH 2018
A SOUTH PACIFIC PERSPECTIVE

University of Ljubljana
Faculty of Health Sciences

Formal education of future food handlers

Capacity to handle food safety issues

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Professional food handlers

European Food Safety Agency (EFSA, 2016):

- Contaminated raw material **(42.2 %)**
- Inadequate cold or hot chain **(32.7 %)**
- Infected person **(18.1 %)**
- Cross-contamination **(10.1 %)**

Nørrung in Buncic, 2008

Todd et al., 2010

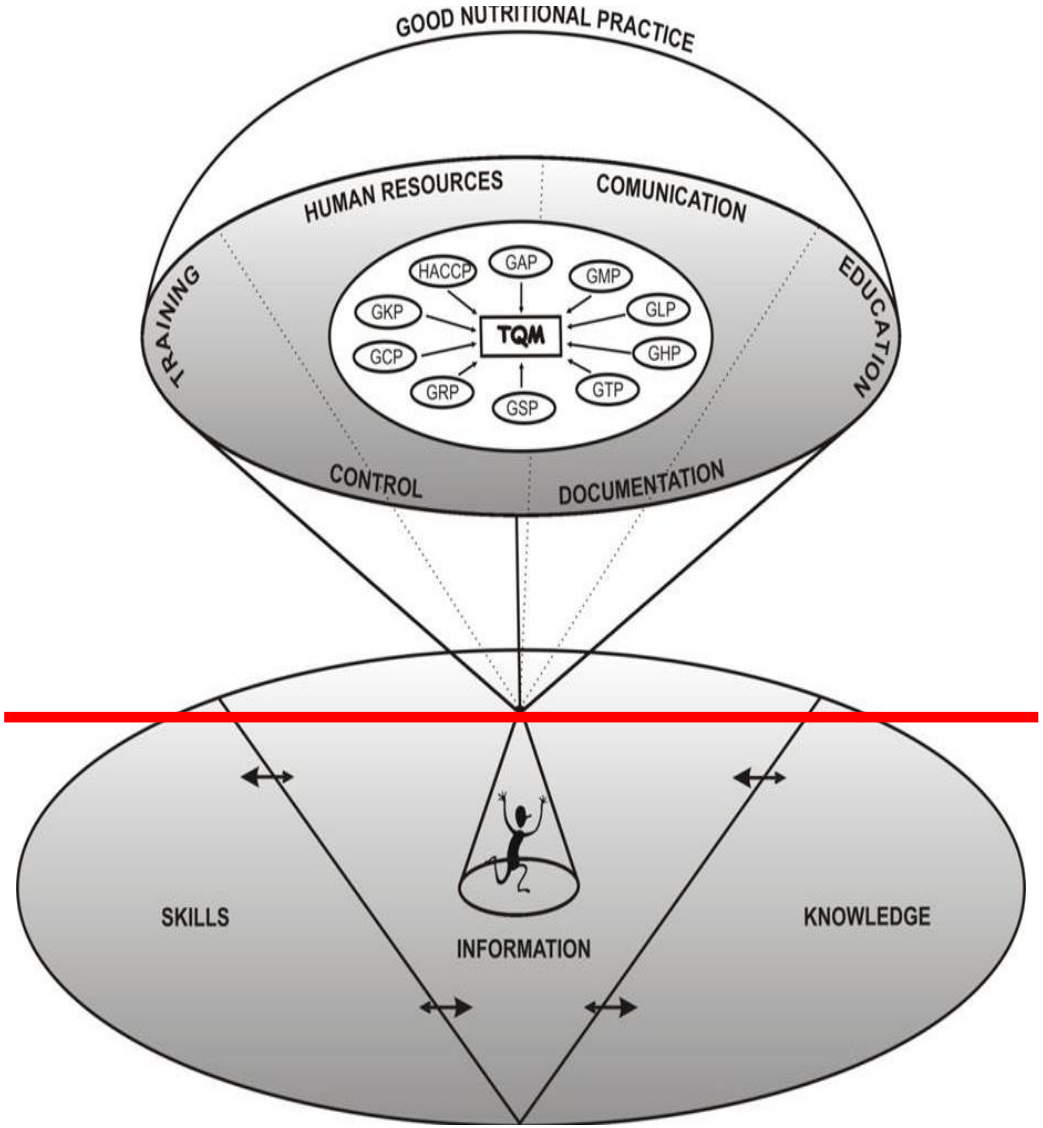
- Infected person
- Improper hand washing
- Ignoring hand washing
- Inadequate cleaning of equipment and utensils that come in contact with food

The most common causes leading to a foodborne outbreak

Our motivation:

THE FOOD HANDLER AS A RISK FACTOR FOR FOOD SAFETY

Insufficiently educated, trained, motivated or satisfied person



Raspor & Jevšnik (2008) Good nutritional practice from producer to consumer. Critical Reviews in Food Science and Nutrition 48(3):276-292.

TARGET organism in our study

Future professional food handler

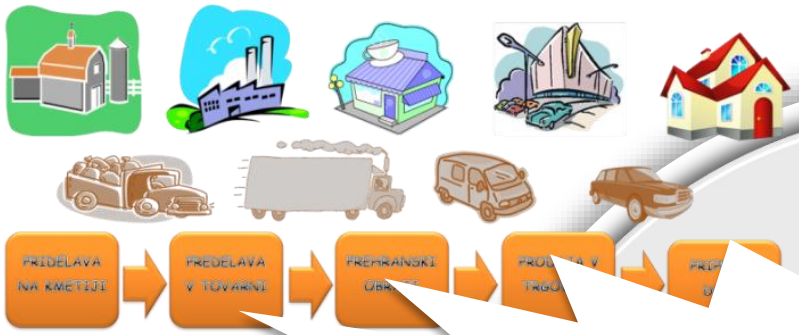
close to the end of his/her formal education.

(vocational level)

Homo sapiens ALIMENTARIUS

1799
First Cookbook in Slovenian language

explanations of individual cooking procedures, description of food properties and instructions for use of foodstuffs, as well as various other instructions for working in the kitchen (hygiene in the kitchen, health, kitchenware, etc.).



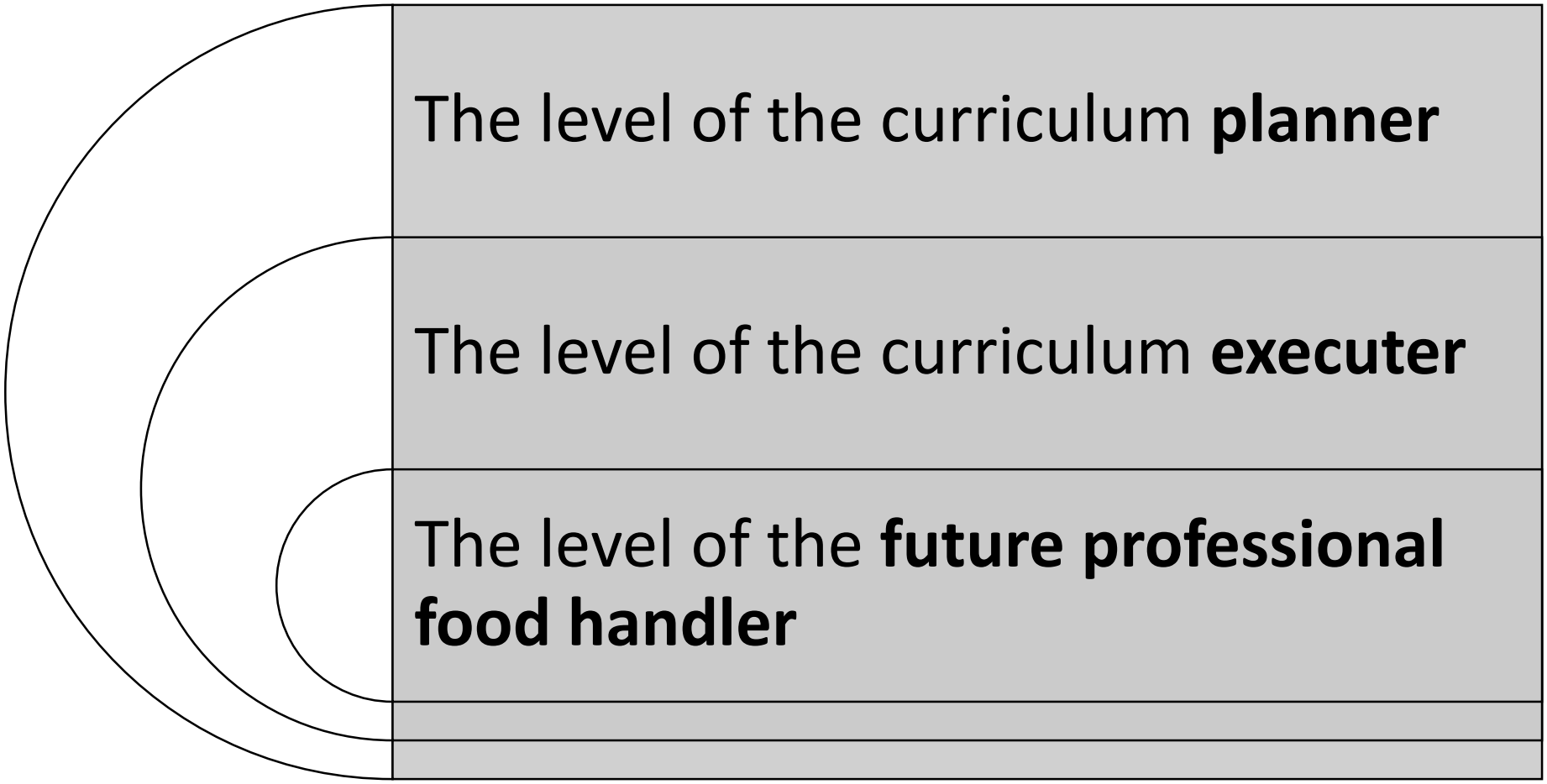
"Does education (elementary and secondary level) provide sufficient qualification of future professional food handlers in the field of food safety?"

Formal education

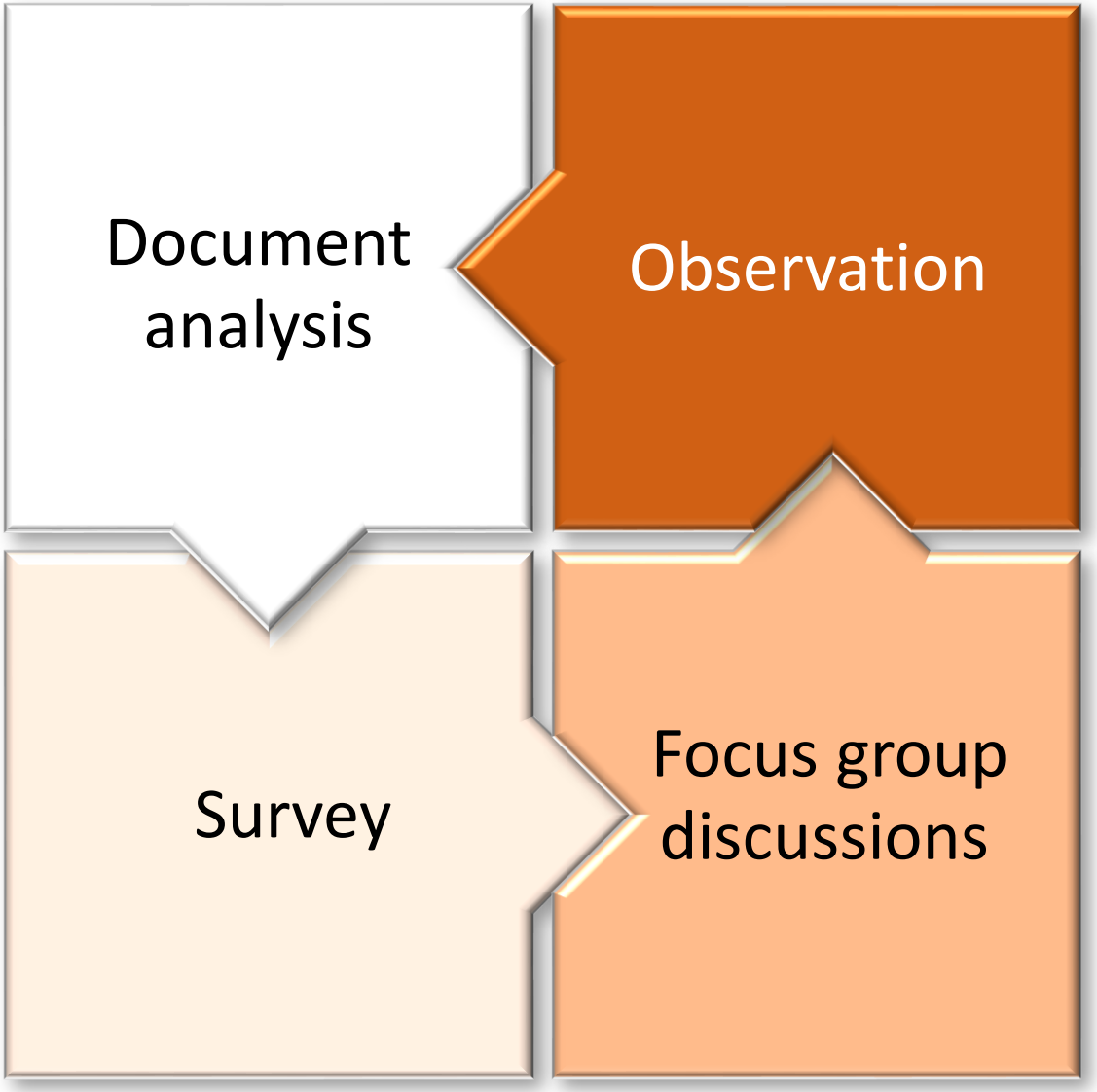
Environment in which we studied the target organism

An individual is not an empty container in which you can easily put relevant information that would then enable to establish the right relationship and behavior in accordance with the principles of food safety (Foster in Käferstein, 1985)

Levels of our study



Methodology: Combined approach



Results

Input

- 88 syllabi analysis
- 1 272 students (elementary level)
- 2 365 students (vocational level)
- 180 teachers (elementary & vocational level)

Output

- 6 original scientific papers
- 1 scientific contribution
- 6 conference contributions

Results

OVCA, JEVŠNIK, RASPOR (2018) Curriculum analysis of food safety competences at elementary and upper-secondary level of formal education inside food-related programmes in Slovenia. ***Journal of Food Science Education.***

OVCA, JEVŠNIK, RASPOR (2014). Food safety awareness, knowledge and practices among students in Slovenia. ***Food Control**, 42*

OVCA, JEVŠNIK, KAVČIČ, RASPOR (2018) Food safety knowledge and attitudes among future professional food handlers. ***Food Control**, 84*

OVCA, JEVŠNIK, JEREB, RASPOR (2016). Effect of educational intervention on young people, targeting microbiological hazards in domestic kitchens. ***Food Policy**, 61*

OVCA, JEVŠNIK, RASPOR (2017) Future professional food handlers' perspectives towards food safety. ***British Food Journal**, 119/2*

OVCA, JEVŠNIK, RASPOR (2018) Food safety practices of future food handlers and their teachers, observed during practical lessons.. ***British Food Journal**, 120/3*

OVCA, JEVŠNIK, RASPOR (2015) Food safety education in primary school: the impact of home economics teacher. ***Environment and Health International**, 16*

Important others

Predšolska vzgoja

Elementary level

Vocational level

Visokošolsko izobraževanje

Food School

First year

Last year

1st triad

2nd triad

3rd triad

Non-food school

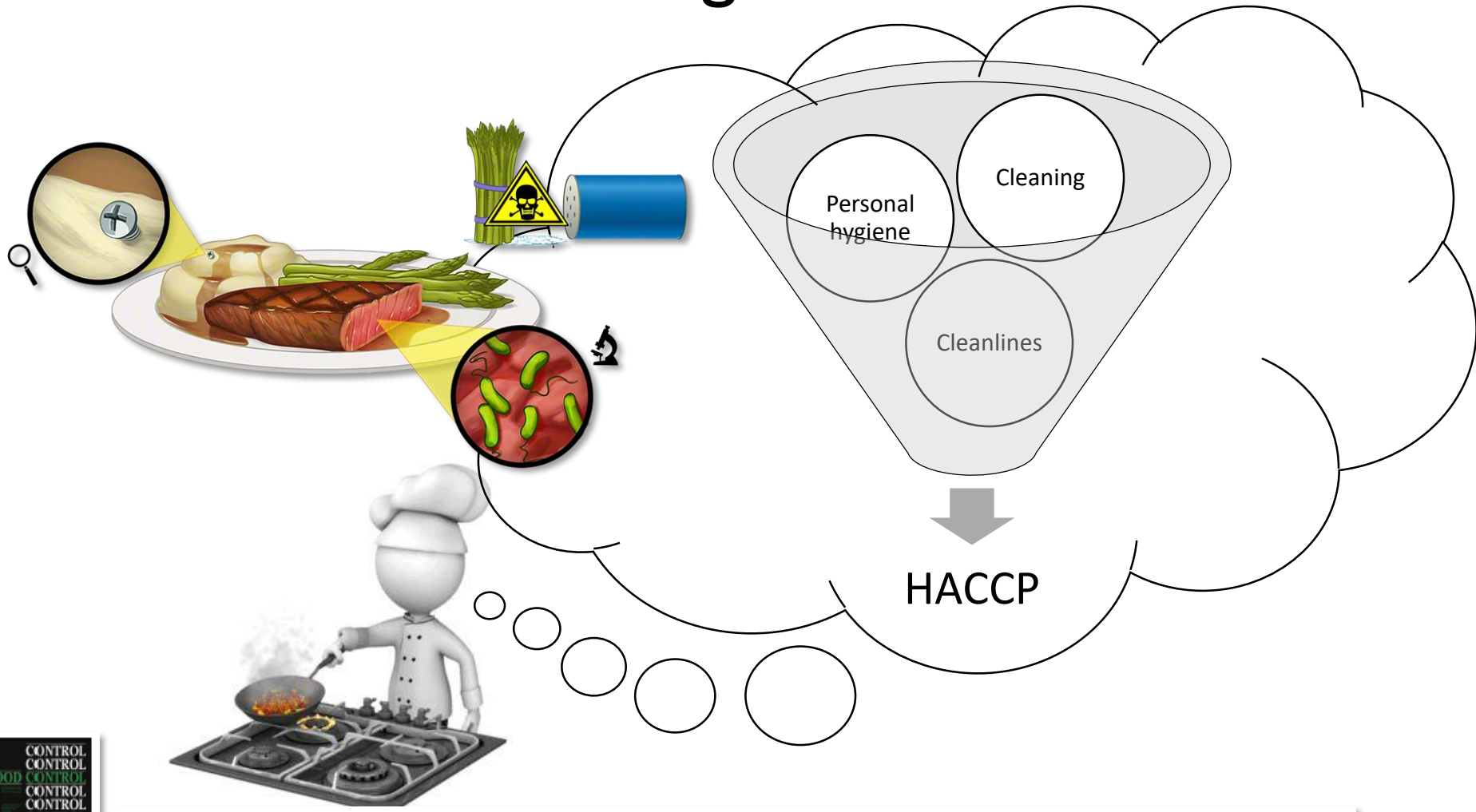
First year

Last year

OVCA, JEVŠNIK, RASPOR (2014). Food safety awareness, knowledge and practices among students in Slovenia. *Food Control, 42*

OVCA, JEVŠNIK, RASPOR (2017) Future professional food handlers' perspectives towards food safety. *British Food Journal, 119*

Knowledge deficit



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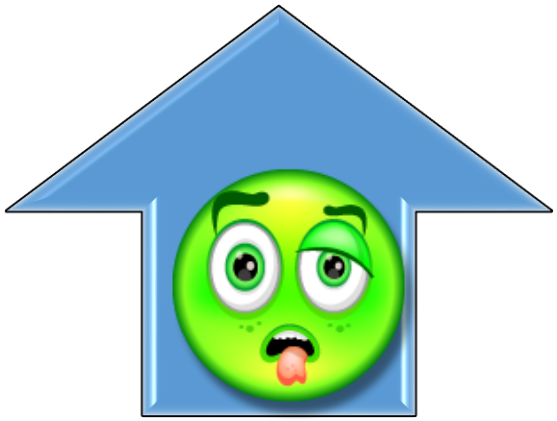
OVCA, JEVŠNIK, RASPOR (2017) Future professional food handlers' perspectives towards food safety. *British Food Journal, 119*

Susceptibility towards food related risk



High perceived risk severity

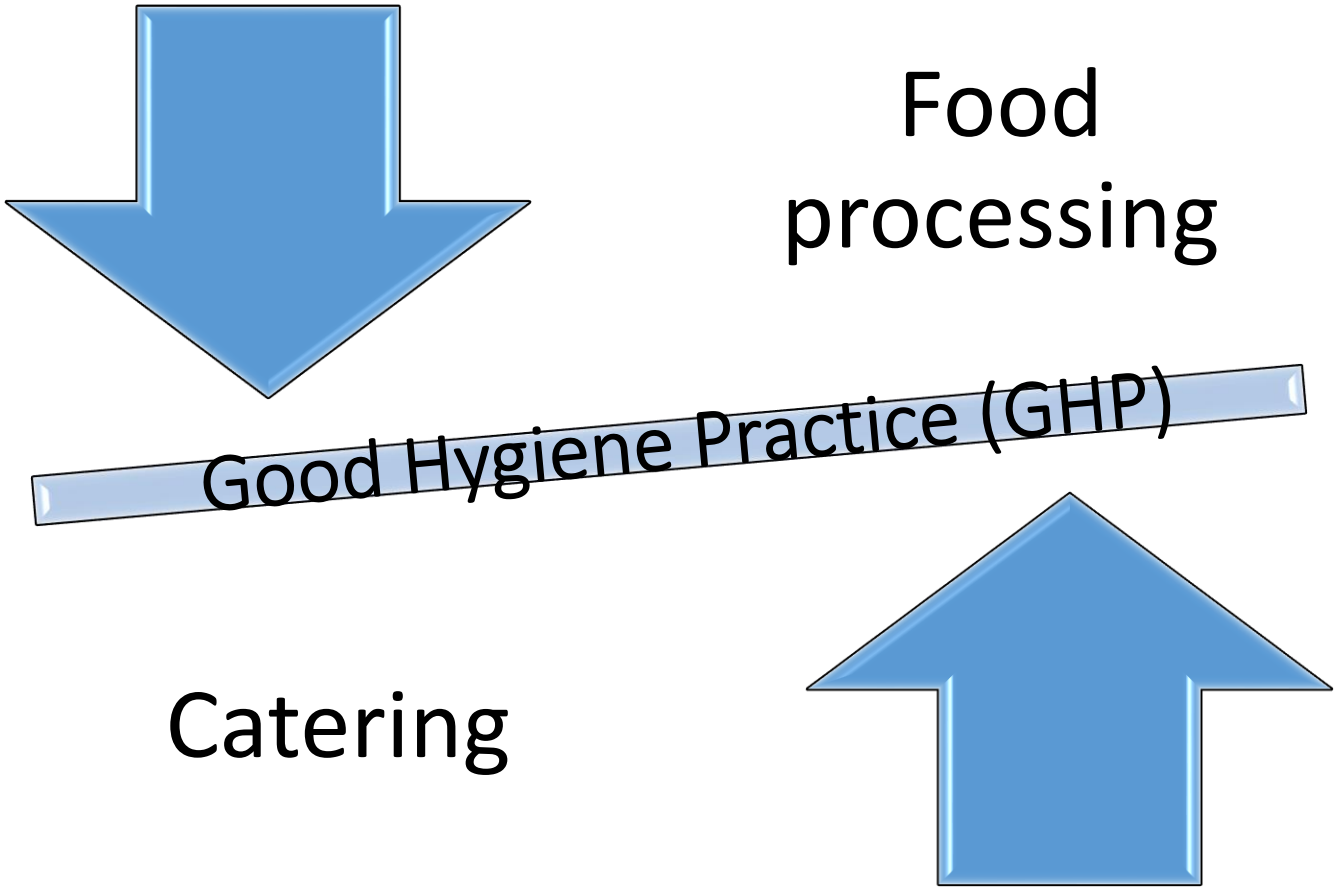
Low perceived vulnerability

Over-confident and under-competent
(Majowicz in sod., 2017)

OVCA, JEVŠNIK, RASPOR (2014). Food safety awareness, knowledge and practices among students in Slovenia. *Food Control, 42*

OVCA, JEVŠNIK, KAVČIČ, RASPOR (2018) Food safety knowledge and attitudes among future professional food handlers. *Food Control, 84*

What are the differences?



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Focus Group Discussions

Food safety

- **Food properties** (Biological risk > Chemical risk > Physical risk)
- **Technology** (Storage conditions and Heat treatment)
- **Good Hygiene Practices** (Handwashing and clothing)

Responsibility

- **As a professional food handler** (Sanction-sensitive and health-sensitive)
- **As a consumer** (Rarely discussed / shared responsibility not included)
- **As a link in food supply chain** (Early links of FSC to be more responsible)

Barriers

- **Working environment** (Time, number of people, organization of work etc.)
- **Personal** – attitude (A fallacy of assuring food safety / high self-confidence)
- **Personal** (Habits, lack of concentration)

Influence of others

- **Parents** (Hygiene related / as a disruptive factor - negative connotation)
- **Teacher in the school** (Perceived as authority figures and role models)
- **Instructor in the food enterprise** (Perceived as authority figures and role models)

Future professionals' food preparation behaviour

Fulfilment of hygiene requirements for food handlers in contact with food by observed groups of students.

Evaluation criteria	Total compliance	Profession specific compliance	
		Catering	Food processing
Working clothes	12/12	6/6	6/6
Health symptoms	11/12	5/6	6/6
Head-coverings	10/12	4/6	6/6
Artificial nails/nail length	9/12	4/6	5/6
Chewing and eating	4/12	1/6	3/6
Visible jewellery	2/12	0/6	2/6

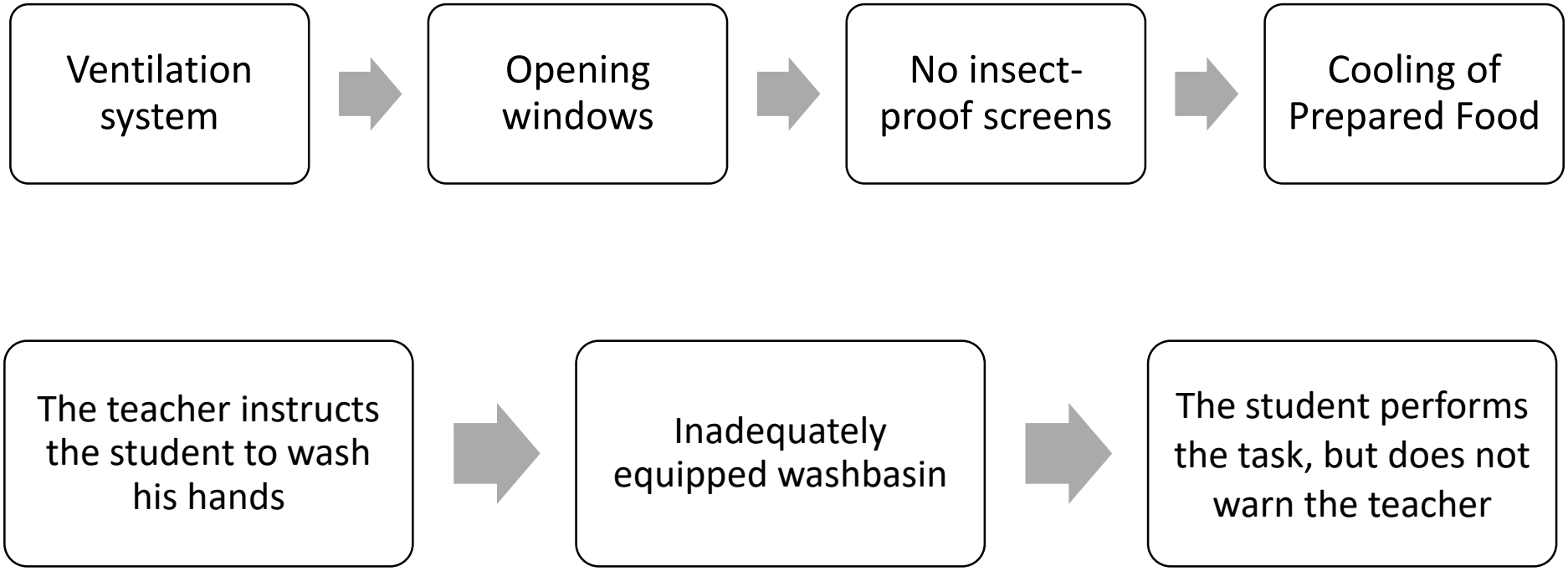
Future professionals' food preparation behaviour

Total and profession-specific compliance (%) of the observed elements of production process with predefined observation criteria.

Observation criteria	Total compliance	Professional area				p value	Chi square
		Catering		Food processing			
		n_2	Compliance	n_3	Compliance		
Hand washing	32.6	131	24.4	139	40.3	.006	7.722
Cleaning	71.7	143	71.3	83	72.2	.890	0.022
Cross-contamination	73.5	93	57.0	77	93.5	.000	28.860
Traceability	60.5	19	15.8	24	95.8	.000	28.423
Handling waste	95.2	22	90.9	20	100.0	/	/
Handling raw material	92.2	22	90.1	3	100.0	/	/
Temperature control	95.7	8	87.5	15	100.0	/	/

n_1 – total number of observed events; n_2 – number of observed events among catering students; n_3 – number of observed events among food-processing students

Interconnected events leading to the incorrect practices



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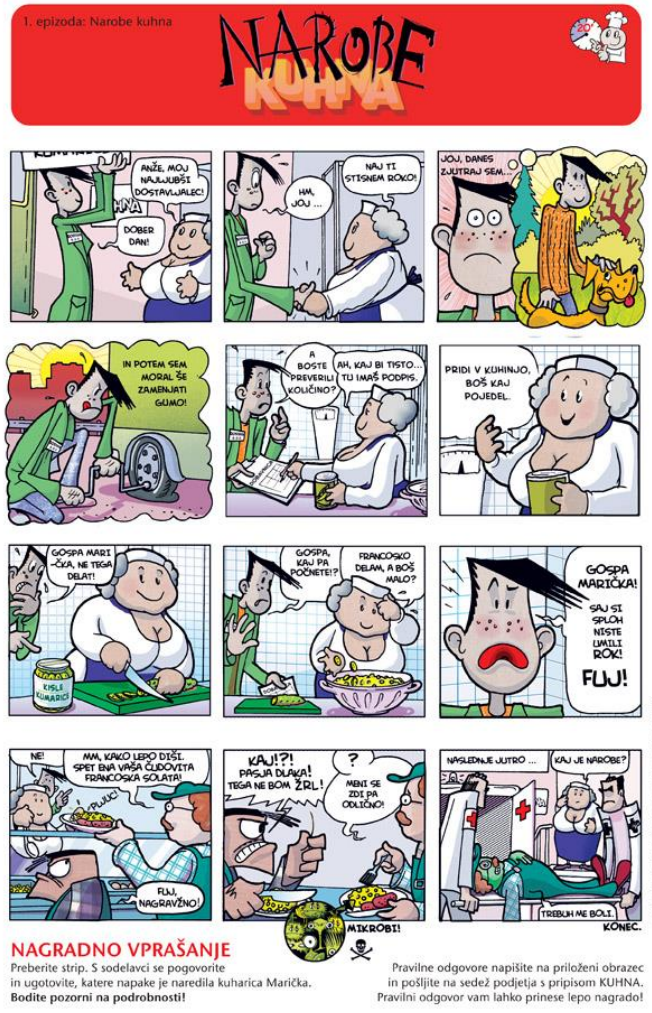
Main conclusion:

Once formal education is completed, on-going training that focuses only on improving knowledge may not assist in overcoming barriers identified with this study.

An example of innovative training approach in catering industry in Slovenia

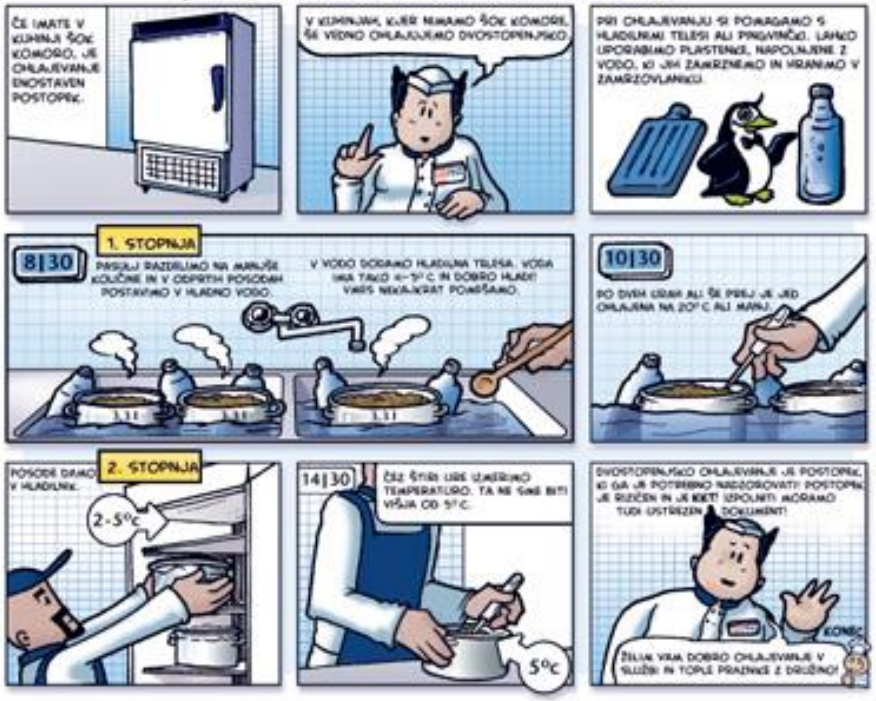


8. epizoda: Prav kuhna
Šef Sale razloži, kako dvostopenjsko ohlajujemo

PRAV KUHNA

slorest

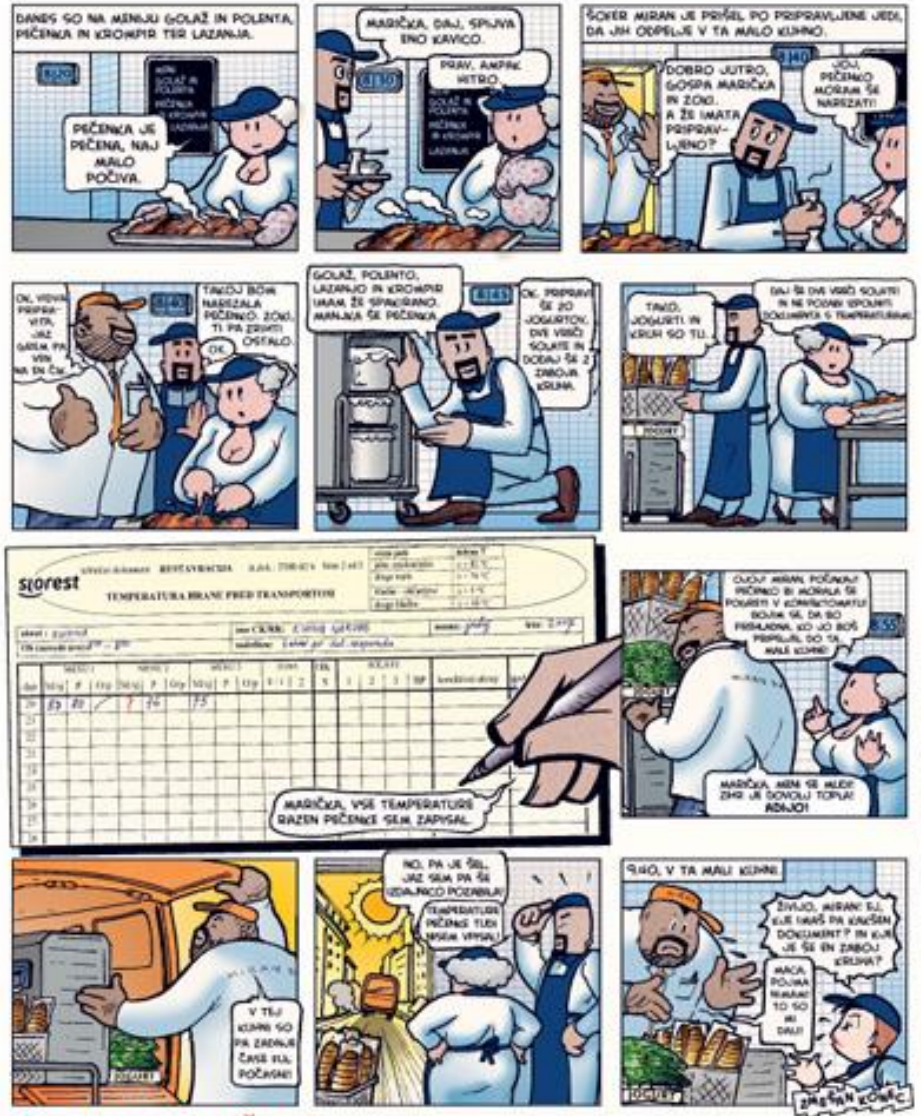
KAKO PRAVILNO DVOSTOPENJSKO OHLAJUJEMO?



9. epizoda: Narobe kuhna

NAROBE KUHNA

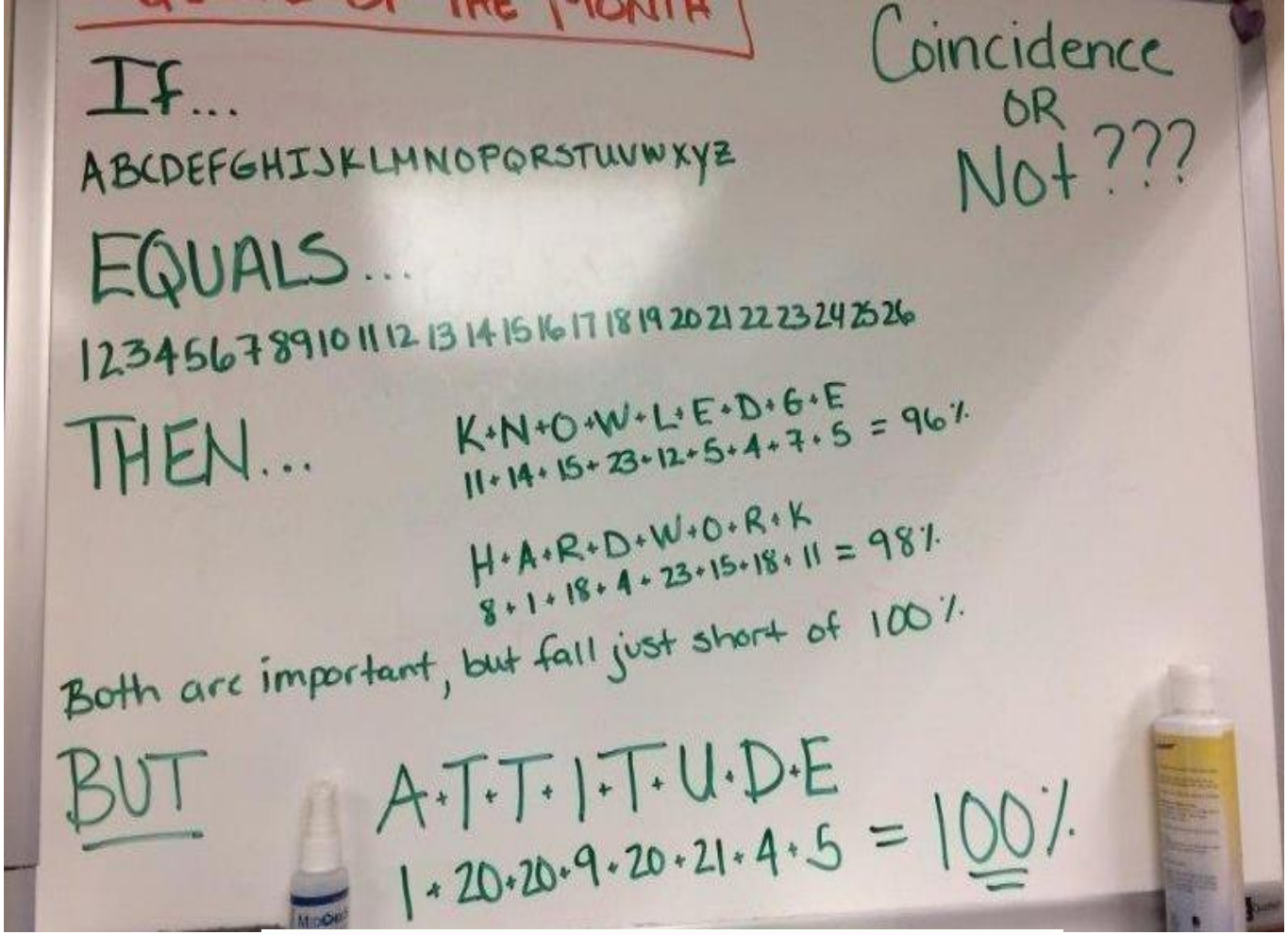
Predstavljamo nova junaka: šoferja **Miran** in kuharico v Ta mali kuhni **Maco**.

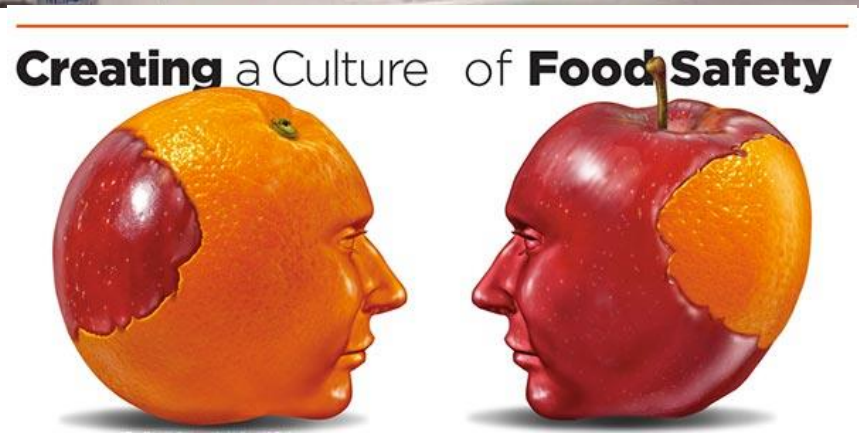


NAGRADNO VPRAŠANJE

Preberite strip. S sodelavci se pogovorite in ugotovite, kakšne napake sta tokrat naredila Zoki in Marička.
Kako bi morala pravilno ravnati?

Pravilne odgovore napišite na priloženi papir in pošljite na sedež podjetja s pripisom KUHNA.
Z malo sreče lahko zadenete lepo nagrado!


If...
ABCDEFGHIJKLMNOPQRSTUVWXYZ
EQUALS...
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
THEN...
K+N+O+W+L+E+D+G+E
11+14+15+23+12+5+4+7+5 = 96%
H+A+R+D+W+O+R+K
8+1+18+4+23+15+18+11 = 98%
Both are important, but fall just short of 100%.
BUT
A+T+T+I+T+U+D+E
1+20+20+9+20+21+4+5 = 100%
Coincidence
OR
Not???


Creating a Culture of Food Safety