

# VARNOST ŽIVIL (nekoč in danes)



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# Hrana je bistvenega pomena za življenje, vendar je lahko tudi smrtno nevarna.



Na srečo je smrtnih primerov relativno malo.  
Vendar imamo velik delež okužb in zastrupitev z živili, ki  
imajo po celem svetu pomembne  
socialne in gospodarske posledice.



# Zgodovina varnosti živil

Date (AD)	Food legislation
1266	Assize of Bread and Ale
1760-1830	Processes for the preservation of food invented
1820	A treatise on adulterations of food and culinary poisons
1848	First Public Health Act
1860	Adulteration of Food Act
1872	Adulteration of Food, Drink and Drugs Act
1875	Sale of Food and Drugs Act
1928	Food and Drugs (Adulteration) Act
1938	Food and Drugs Act
1955	Food and Drugs Act
1976	Food and Drugs (Amendment) Act
1984	Food Act
1990	Food Safety Act
1993	Council Directive EC 93/43
1995	Food Safety (General Food Hygiene) Regulations
2004	Hygiene of Foodstuffs EC 852/2004

- ☞ Nekdaj so se ljudje učili na podlagi poskusov in napak. **Začeli so razvijati osnovne oblike konzerviranja, ki so pripomogle k varnejši hrani** (npr. sušenje, soljenje , fermentacija, ...).
- ☞ V zakonih starodavnega ljudstva so bili že vključeni **nasveti o higieni živil**.
- ☞ Leta 2000 pr. n. št. so v **Mojzesovi knjigi** predstavljeni zakoni kako zaščititi ljudstvo zaradi bolezni, povezanih s hrano (npr. pranje oblačil in kopanje po žrtvenem zakolu živali)

# Časovnica razvoja varnosti živil

50000 BC	Early humans	Self preservation
4000 BC	Various	Early food fermentation
2000 BC	Leviticus	Religious beliefs
AD 1676	Antonie van Leeuwenhoek	Origins of Microbiology
AD 1810	Nicholas Appert	Basis of commercial heat processing
AD 1857	Pasteur	Early Food Microbiology
AD 1880	Gartner	First isolation of <i>Salmonella</i> from food poisoning outbreak
1880 to date	Salmon, Russell, Frazier and many others	Start of Golden Age of Food Microbiology

# Razvoj živilske mikrobiologije



- ❧ Živilska mikrobiologija je imela svoj izvor v mlekarški mikrobiologiji, s poudarkom na predelavi in roku uporabe, namesto varnosti hrane.
- ❧ **Wiliam Frazier:**
  - ❧ eden izmed prvih piscev živilske mikrobiologije;
  - ❧ v 1 izdaji (1944) malo informacij o varnosti živil;
  - ❧ **V revidirani izdaji (1956) že 3 poglavja o varnosti živil** (Zastrupitve in okužbe z živili, Bolezni, ki se prenašajo z živili in Mikrobiologija živil rastlinskega izvora.
- ❧ Od takrat naprej je bila varnost živil ena izmed pomembnih komponent živilske mikrobiologije za novo tisočletje.



# Zgodovina varnosti živil po desetletjih – 50. leta

## At this time...

Retired veterinary surgeon André Dupont remembers an epidemic in Belgium in the 1950s before he qualified as a vet:

*"A trainload of animals were transported from Belgium to Italy and on arrival they were showing foot-and-mouth symptoms. They hadn't left the train but there were outbreaks of disease all the way along the route the train took."*



- Intensively reared beef production uses over 33 times as much energy as pasture beef production to produce the same quantity of meat. Now that's intense!
- In the 1950s, the French ate 2.5 times more potatoes than they do today.
- One in five people across the EU worked in farming.



1957

## First supermarket in Belgium

The opening of the first supermarket in Belgium (Place Flagey, Brussels, December 18, 1957).

Photos © Archives Groupe Delhaize



## Animal welfare

The way in which animals were reared began to change to more intensive production.



1954

## Foot and Mouth Disease

The European Commission is an active partner of an organisation for Foot-and-Mouth Disease, which was set up in 1954 under the Food and Agriculture Organisation to coordinate cooperation between the countries of Europe.



# Zgodovina varnosti živil po desetletjih – 60. leta



**1962**

## Common Agricultural Policy

As the EU's founding members emerged from a decade of food shortages, they searched for a sustainable food supply solution. This resulted in the Common Agricultural Policy (CAP), which came into force in 1962. To begin with, the CAP subsidised production of basic foodstuffs to promote self-sufficiency and food security. Its role has developed over the years, however, to encompass other issues such as food safety and the environment.



**1963**

## Codex Alimentarius

The Codex Alimentarius was set up in 1963 as a joint instrument of the United Nations Food and Agriculture Organisation and the World Health Organisation. Its primary mission is to protect the health of consumers and to ensure fair practices in international food trade, by developing common food safety standards.

Photo © FAO

The first EU food **hygiene rules**,

**1964**

## Intra-Community trade

In 1964, the first legislation on animal health entered into force: Council Directive 64/432 on animal health problems affecting intra-Community trade in bovine animals and swine, and Council Directive 64/433 on health conditions for the production and marketing of fresh meat. The new rules harmonised regulations across Member States, such as laws on testing for tuberculosis.



## Good advice

*"To provide good meals for the whole family, you must start by getting the best out of the resources on offer at your home, garden and farm (in the country), markets and shops (in town). You must therefore learn to buy and store products."*

Taken from "Cooking over the months", a cookery guide free with every purchase of a Frigidaire.

Photo © Studio GOS



**1967**

Launch of fresh pasteurised milk.

Photo © Studio GOS

**1966**

In 1966, 130 million tourists were moving between countries in Europe, with Spain alone receiving 15 million visitors.



# Zgodovina varnosti živil po desetletjih – 70. leta



Food chain production



**1971**

## First fast-food restaurants in Europe

On 3 July 1971, the first fast-food restaurant – Quick – opened at Schoten in Belgium.

## PESTICIDES

The first EU rules on pesticides were adopted in 1976. These set **maximum residue levels** (MRLs) for pesticides in fruit and vegetables i.e. the highest amount of pesticide residue allowed to be found on these foods. In 2005, a new EU regulation on **residues of pesticides in food** was adopted and is due to enter into force in 2008.



**1979**

## The Rapid Alert System for Food and Feed (RASFF)

The RASFF network has been in place since 1979 and was enhanced by the General Food Law in 2002. Members of the network are the Member States, the European Commission, the European Food Safety Agency, Iceland, Liechtenstein and Norway. RASFF enables the rapid exchange of information between national competent authorities on all foodstuffs and animal feed, specifically when a national authority has identified a risk to human health and taken measures, such as withholding, recalling, seizure or rejection of



Famous friterie, Belgium, 1970.

**1973**

## Expansion of supermarkets

In the 1970s, the German discount store ALDI expanded internationally, while, in 1973, the first LIDL opened its doors to the public. In the same year, Carrefour moved out of France to open its first outlet in Spain.





# Zgodovina varnosti živil po desetletjih – 80. leta

**1980**

## Working women

In 1980, working women made up 37% of the adult population in Europe.



**1986**

## Chernobyl

The Chernobyl nuclear disaster left the soil around the fall-out area contaminated for several years.



In the mid-1980s, tropical fruits and spices became part of the average European's diet.

**1985**

## Eating out

In West Germany, a full 20% of a household's food budget is spent on eating out.

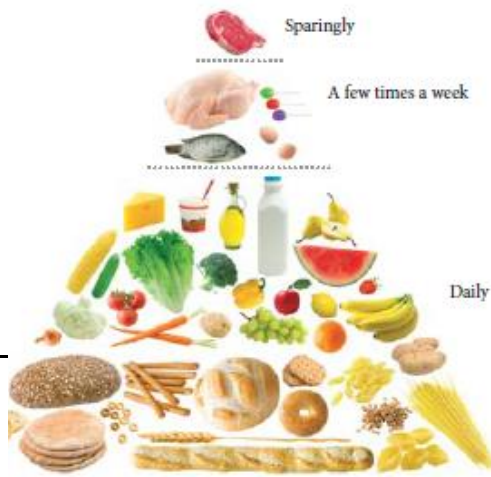
## Mediterranean food pyramid

Eaten...

Sparingly

A few times a week

Daily



**1985**

## Safer beef

The EU banned the use of growth hormones in beef production.

In 1988, the EU-15 imported €6.4 million of agricultural products from the ACP (African, Caribbean and Pacific) countries, almost 3 times as much as they exported to this region.



# Zgodovina varnosti živil po desetletjih – 90. leta



## EU Action: tackling BSE

The number of animals which have tested positive for BSE in the EU have fallen steadily since the mid-1990s, from 24 476 in 1994, to 865 in 2004. This downward trend continues, largely due to the strict and effective BSE measures in place at EU level. At its peak in 1992, BSE affected over 37 300 cattle in the EU, although all except 21 of these cases occurred in the UK.

In France, annual per capita consumption of frozen foods, especially ready-prepared meals, increased from 2 kilos to 37 kilos between 1965 and 1995 (Secodip).

1995

## Supermarket choice

One major European supermarket chain estimated that the number of food items in a typical retail store had increased from 550 in 1954 to more than 10 000.



1995

## Time spent at the table decreases

A survey in France indicated that time spent each day eating at the table decreased from two hours 30 minutes in 1965 to one hour 20 minutes (INSEE).



## TRACES (Trade Control and Export System)

TRACES was set up in 2004 as an EU system for keeping track of animals within the EU and those coming from third countries. It allows the electronic exchange of the health and veterinary documents necessary for animal imports and trade within the EU, and also features other information such as the list of third countries authorised to export animal products to the EU. In the event of a disease outbreak, TRACES enables all potentially affected animals to be quickly identified, so that the appropriate measures can be taken.

Photo © European Community



# Zgodovina varnosti živil po letu 2000



## A new approach

*"The year 2000 marked an important development for food safety in the EU, with the adoption of the Commission's White Paper. This set out an innovative new approach for EU food safety policy, integrating it into every step of the food chain. It is largely thanks to this "farm to fork" approach that European consumers can rely today on one of the highest levels of food safety in the world."*

Paola Testori Coggi,  
Deputy Director General for Health and Consumer  
Protection, European Commission.

## Meeting fresh challenges

*"This was a decade of fast-paced innovation in the food sector. New technologies and novel products were raising new questions and presenting more options to the European consumer. The challenge was to keep pace with these changes – to understand their impact and harness their potential benefits, while still ensuring that human and animal health was fully protected. The Commission's approach is to base each decision firmly on scientific advice and risk analysis, while working closely with stakeholders on each new development to ensure the most effective and proportionate response."*

Robert Madelin,  
Director General for Health and Consumer Protection  
**Better Training for Safer Food**

Better Training for Safer Food is an ambitious programme started by the European Commission in 2005. Under this initiative, training is provided to both European and third country officials who are responsible for checking that EU rules related to food and feed, animal health and welfare, and plant health are properly applied. In providing such training, the Commission aims to ensure that the control authorities have a full and uniform understanding of EU rules in this area, so that food and feed put on the market meets the high safety standards that are expected.

*"The Better Training for Safer Food workshops provide a very important opportunity for official authorities in non-EU countries to update their knowledge of the rules in force in the area of food safety."*

Ms. Adriana Venezuela, Agricultural Engineer in the Agricultural Livestock Service, Chile.

Photo © European Community



## 2007

### Packaged food and soft drinks

In 2007, sales of packaged food and soft drinks in the New Europe (the 8 Eastern European countries which acceded to the EU in May 2004, plus Cyprus, Malta and, from the beginning of 2007, Romania and Bulgaria) are outstripping growth in the Old Europe by a considerable margin.

## 2005

### Breakfast

A typical European skipped 18.5% of breakfast occasions which equates to 67.5 occasions per year.

Source: MarketResearch.com



## "Nouvelle cuisine"

*"Despite the influence of the EU accession and more imported products, traditional dishes remain dominant as far as the Bulgarian diet is concerned. These include kebapcheta and kjufteta (grilled and fried meatballs) and shopska salata (a salad of tomatoes, cucumbers, peppers and Bulgarian white cheese)."*

Simeon Chenev,  
Bulgarian Policy Adviser in the 2000s.



## At this time...

*"EFSA is the EU reference body for risk assessment in the fields of food and feed safety, animal health and welfare, nutrition, plant protection and plant health. In close cooperation with national authorities and in open consultation with its stakeholders, EFSA provides independent scientific advice and clear communication to the European institutions on existing and emerging risks. Our scientific advice underpins EU food and feed policy and legislation thus contributing to a safe and healthy diet for the European Consumer."*

Catherine Geslain-Lanéelle,  
Executive Director,  
European Food Safety Authority (EFSA).

## Genetically modified soya



that it can trace the source of all GM ingredients used in any food product. This information has enabled us to label GM products.

You will, however, find very few GM food products that contain genetically modified ingredients.

has the widest possible choice of food should you wish to avoid genetically modified crops. We will continue to keep you informed about developments in genetically modified foods. Eurogroup's members are only members of the EFSA.



**In Western Europe, 15 years ago the average meal preparation time was one hour. Now it is 30 minutes.**

**Europeans are getting taller! Between 2002 and 2005, the average height increased in most Member States and the EU median is now 169.9 cm.**


**Over the same period, the average weight increased by 0.5kg: from 71.7 kg in EU-15 in 2002 to 72.2kg in EU-25 in 2005.**

# Razvoj varnosti živil - večja varnost



*And gave him a commandment, saying, 'Thou mayest surely eat from every tree in the garden, but from the Tree of Knowledge of good and evil, thou shalt not eat: for on the day thou eat from it, thou shalt surely die.'*

Genesis 2:16-17

 **Z večtisočletnimi izkušnjami o zagotavljanju varne hrane, skupaj z več kot 160 let razvoja živilske mikrobiologije in najnovejšimi metodami molekularne biologije bi lahko domnevali, da ne obstajajo problemi na področju zagotavljanja varne hrane.**



 **ŠTEVILO OKUŽB IN  
ZASTRUPITEV  
Z ŽIVILI **NI ZANEMARLJIVO****





# Število alimentarnih izbruhov v EU in Sloveniji s podatki o številu obolelih, hospitaliziranih in mrtvih v letih 2007 – 2013.



Leto	Število izbruhov						Število obolelih (v vseh izbruhih)					
	EU			Slovenija			EU			Slovenija		
	N	na 100 000	Potrjeni	N	na 100 000	Potrjeni	Oboleli	H	M	Oboleli	H	M
2007	5 609	1,1	2 025	17	0,90	17	39 727	3 291	19	779	67	5
2008	5 332	1,1	890	17	0,80	1	45 622	6 230	32	845	41	0
2009	5 550	1,1	977	5	0,20	3	48 964	4 356	46	83	21	1
2010	5 262	1,1	698	3	0,20	3	43 473	4 695	25	121	0	0
2011	5 648	1,1	701	8	0,39	0	69 553	7 125	93	95	13	4
2012	5 363	1,1	763	10	0,49	10	55 453	5 118	41	490	15	0
2013	5 196	1,2	839	4	0,19	0	41 962	5 946	11	56	9	0

Legenda: N – Število izbruhov; H – Hospitalizirani; M - Mrtvi

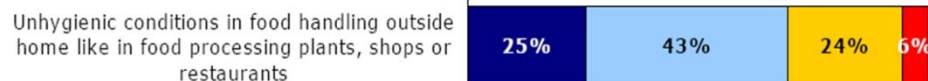
# Delež potrjenih alimentarnih izbruhov (%) v EU glede na mesto pojava v letih 2007 – 2013.



Leto	Domače gospodinjstvo	Gostinski obrati	Šole in vrtci	Bolnišnice in ostali zdravstveni objekti	Interni obrati javne prehrane	Ostalo	Neznanega izvora
2007	37,0	28,6	8,0	4,5	6,8	11,6	3,4
2008	38,0	23,1	5,3	2,6	4,3	13,5	13,3
2009	36,4	20,6	5,5	4,8	4,9	12,7	15,0
2010	38,7	30,8	6,7	0,6	7,9	12,3	3,6
2011	32,7	34,4	4,4	1,0	5,2	19,9	2,4
2012	39,7	23,9	6,3	1,2	2,8	16,5	9,6
2013	38,5	22,2	8,3	2,3	5,0	14,7	6,3

For each of the following issues, please tell me if you are very worried, fairly worried, not very worried or not at all worried by it?  
%EU

■ Very worried ■ Fairly worried ■ Not very worried ■ Not at all worried ■ DK



Consumers

Food handlers



# Sistemski pristop k zagotavljanju varnih živil



Proizvodnja živil  
Zakonodaja

**ZASTRUPITVE IN OKUŽBE Z ŽIVILI**

Tveganja  
(MB, KE, FI)

# Zagotavljanje varnosti živil je multidisciplinarni problem

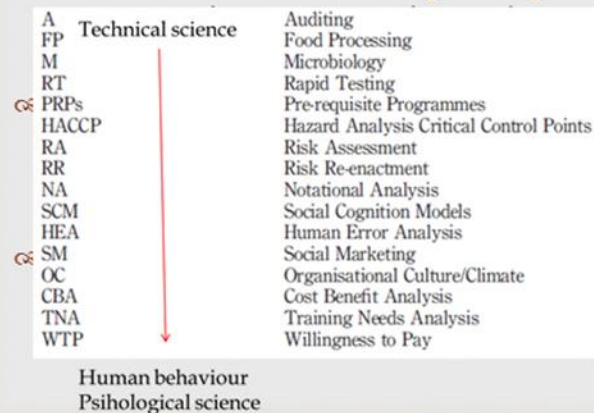




# Človeško vedenje



## Sodobni metodološki pristopi



Griffith, 2006; Jevšnik in sod., 2008

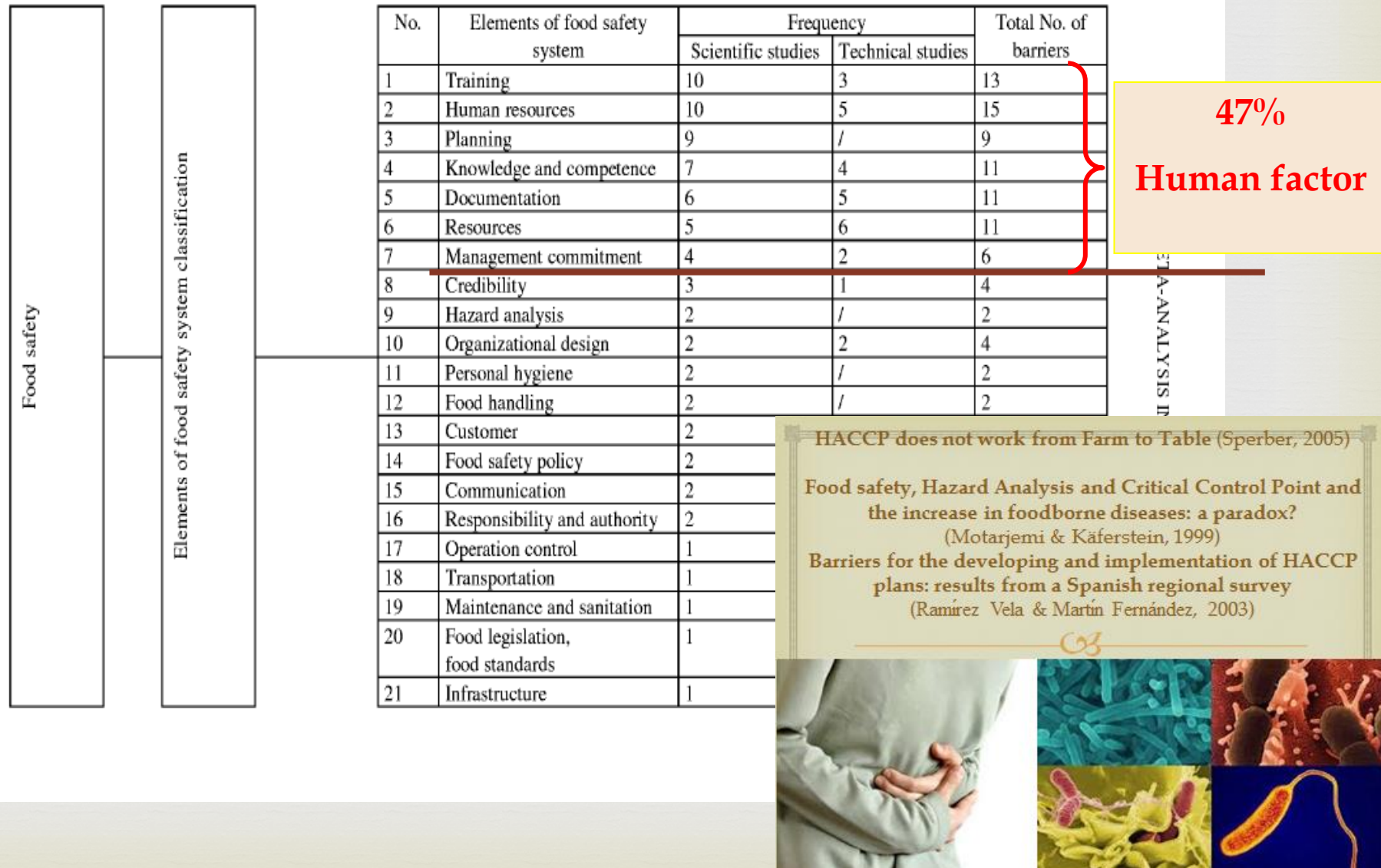
- ❧ **Priznanje, da je človeško vedenje povezano z organizacijsko kulturo** je sprožilo nove pristope k izboljšanju zagotavljanja varnosti živil v celi verigi.
- ❧ **Novi pristopi vključujejo uporabo psiholoških modelov** (npr. Modeli socialne kognitivne teorije, opazovalne študije, analiza napak - razumeti, mogoče napovedati in potem spremeniti / izboljšati vedenje).
- ❧ **Potrošniške organizacije morajo prevzeti pobude, ki temeljijo na splošnem zavedanju potrošnikov o varnosti preskrbe z živili.**

(Griffith, 2006)

# META-ANALYSIS AS A TOOL FOR BARRIERS IDENTIFICATION DURING HACCP IMPLEMENTATION TO IMPROVE FOOD SAFETY

M. JEVŠNIK<sup>a</sup>, V. HLEBEC<sup>b</sup> and P. RASPOR<sup>c\*</sup>

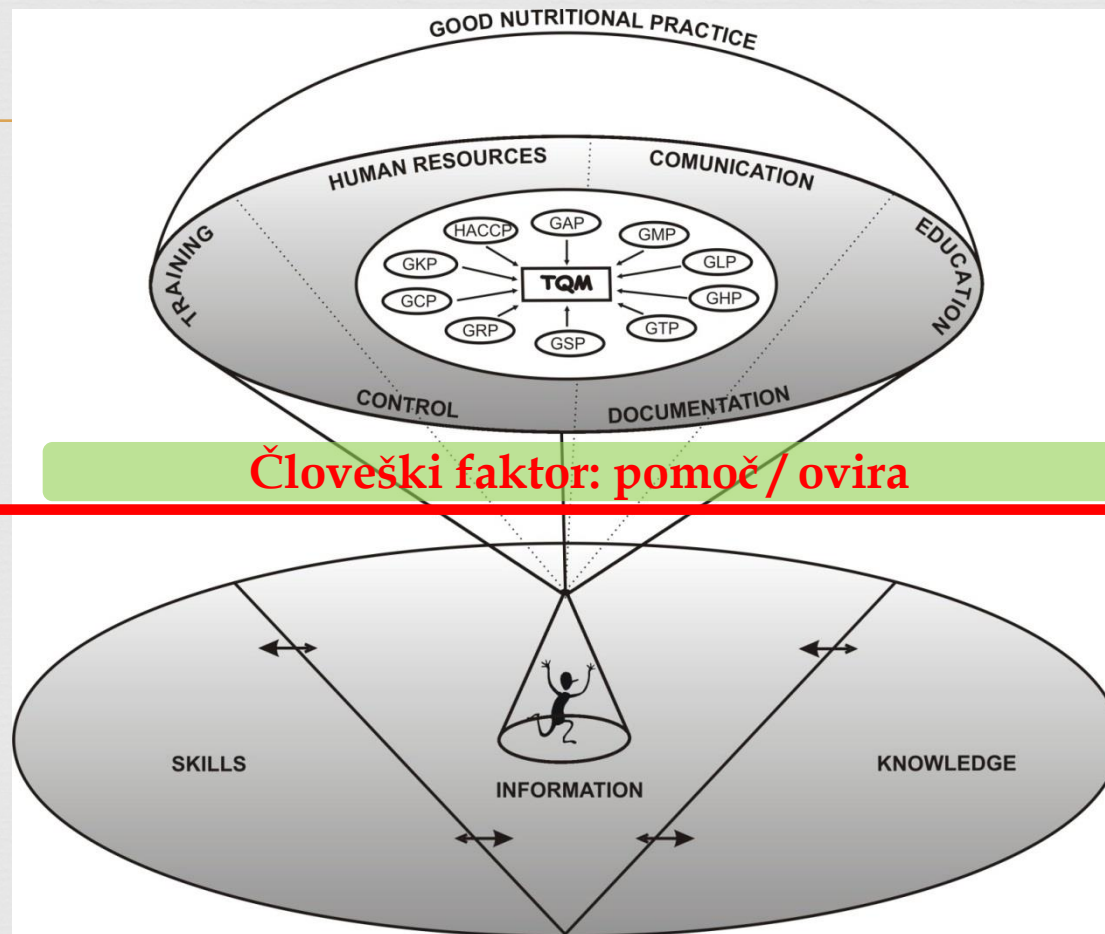
Fig. 1. Classification of elements and ranking the influence of a specific element on HACCP efficiency





# Dejavnik tveganja: človek

Je sedanji način izobraževanja / usposabljanja dovolj učinkovit?



Food safety platform: balanced model for ensuring food safety from Good Nutritional Practice viewpoint

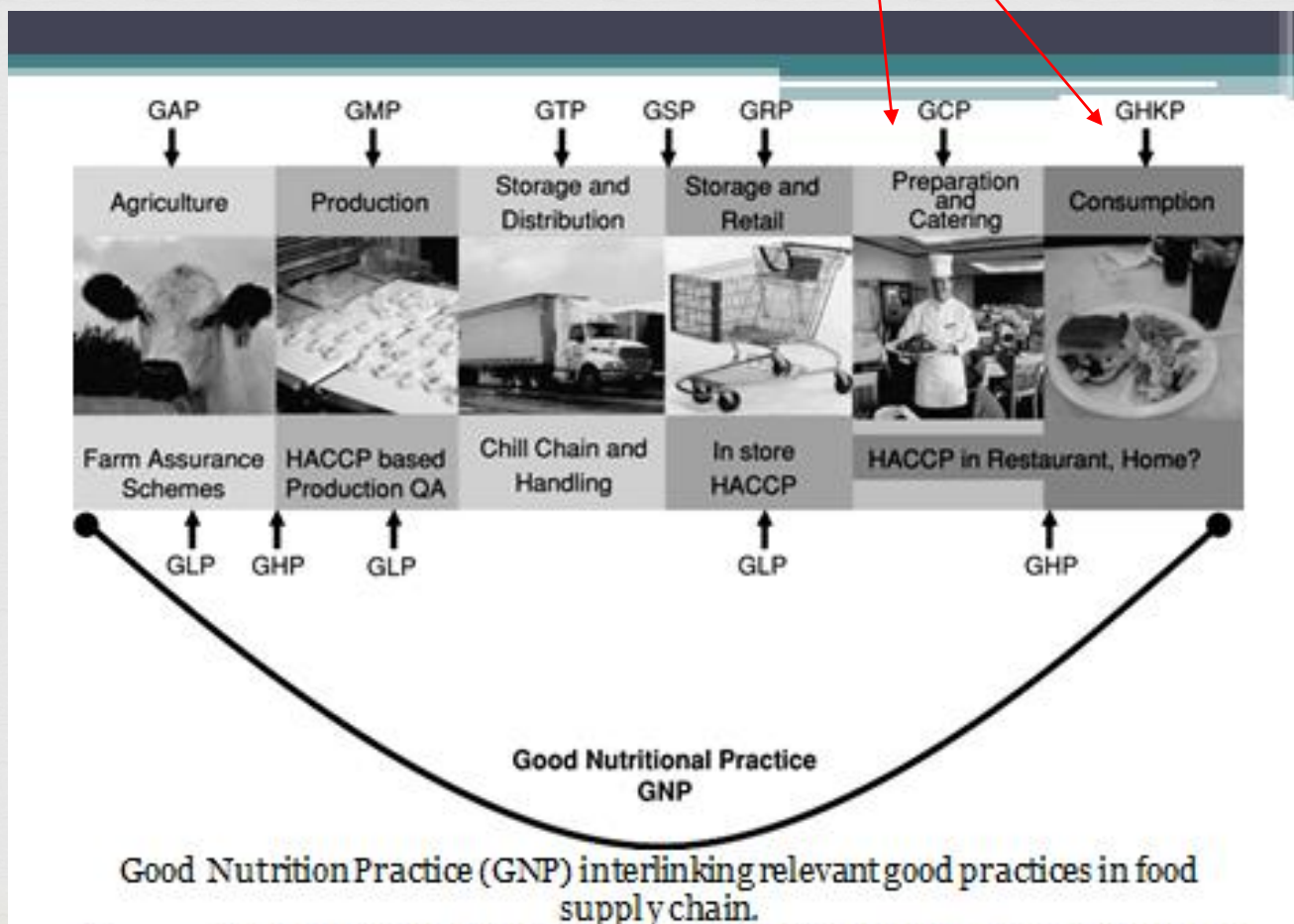
Raspor, P., Jevšnik, M., 2008. Good nutritional practice from producer to consumer. *Critical Reviews in Food Science and Nutrition*, 48, 276–292

Da bi bila danes in v bodoče  
živila res varna...

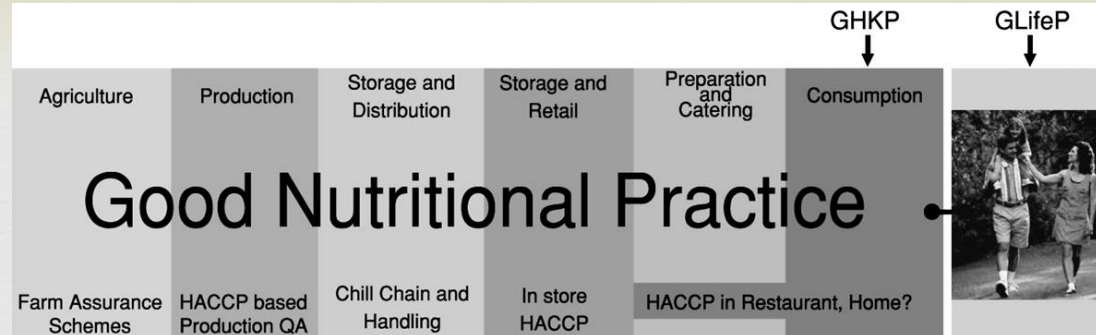




# Veriga varnosti živil je tako močna kot je močen njen najšibkejši člen.



„From Farm to Fork“  
“From stable to table”  
“From spring to drink”  
(Raspor, 2006)



Terminologija ni poenotena

⌘ Ang. Food supply chain

⌘ Slo. Živilska veriga

⌘ Termin bi bilo potrebno preimenovati v

**»živilsko/prehransko/oskrbovalna veriga«,**

ki izpostavi tri pomembna področja:

**ŽIVILSTVO, PREHRANO IN OSKRBO,**

ki jih povežejo dobre prakse na poti od polja do mize v krogotok zagotavljanja varnih in zdravih živil za potrošnika.

(Raspor & Jevšnik, 2008).



Sporočilo nove terminološke paradigme  
se kaže v skrbi za

„kakovost življenja ljudi“,  
kamor nedvomno sodi tudi  
varnost živil.

(Raspor & Jevšnik, 2008).



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HVALA ZA POZORNOST