RASTLINNÉ ALTERNATÍVY POD LUPOU : MIKROBIOLOGICKÁ BEZPEČNOSŤ RASTLINNÝCH ALTERNATÍV

MVDr. Cabanová Lenka, PhD

Štátny veterinárny a potravinový ústav v Dolnom Kubíne

23th Meeting of Microbiological Risk Assessment (Oct 2023)

- Dohoda, že je potrebné vykonať štúdiu
- MS´s súhlasili, že projekt zastreší EFSA
- Keďže tieto potraviny sa tešia čoraz väčšej obľube, je potrebné vedieť ich potenciálne riziko
- RTE potraviny – živočíšna bielkovina je nahradená inými ingredienciami, ktoré môžu predstavovať riziko kontaminácie (orechy) najmä v surovinách z tretích krajín– zaznamenané nálezy – *Salmonella, E.coli, Listeria*
- *Bacillus sp., Clostridium spp*. – častý nález v rastlinných komoditách
- Cieľ : získať potrebné dáta pre risk-management
    - Spolupráca medzi jednotlivými MS´s
    - Zvýšiť povedomie o rastlinných náhradách medzi spotrebiteľmi

slido.com #1051175



- Dohoda, on-line stretnutia
- 15 krajín – zastrešovanie Írsko
- Vytvorená online platforma na komunikáciu a prístup
- aw, pH
- *Listeria spp. (detection, enumeration)*
- *Listeria monocytogenes (detection, enumeration)*
- *Enumeration E.coli*
- *Salmonella spp.*
- *Clostridium, Bacillus, STEC*
- 100 vzoriek
- Vyšetrovať tesne pred dátumom spotreby
- ISO alebo validované alternatívne metódy

Typy vzoriek

3.2.1. Suitable to sample

- ✓ Pre-packed RTE plant-based milks and creams (e.g. oat, soya, rice, coconut etc.)
- ✓ Pre-packed RTE plant-based vegan/vegetarian cheese substitutes (e.g. plant-based alternatives to cheddar, brie, mozzarella, cheese spread etc.)
- ✓ Pre-packed RTE plant-based vegan/vegetarian meat substitutes (e.g. plant-based alternatives to deli meat slices, chicken pieces, pepperoni etc.)
- ✓ Pre-packed RTE plant-based vegan/vegetarian fish and shellfish substitutes (e.g. plant-based alternatives to smoked salmon, scallops etc.)
- ✓ Pre-packed RTE dairy or meat alternatives made from ingredients such as tofu or tempeh

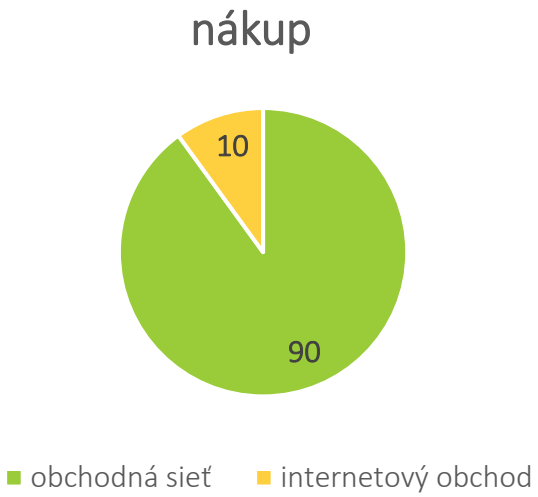
3.2.2. Do not sample

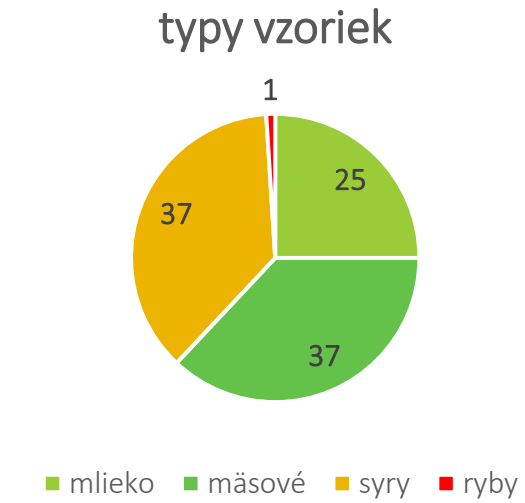
- ✱ Non-RTE plant-based meat substitutes (e.g. meat-free burgers, meat-free sausages, meat-free chicken nuggets etc.)
- ✱ RTE plant-based butter-like spreads
- ✱ RTE plant-based ice cream
- ✱ RTE plant-based yogurt
- ✱ RTE plant-based milk or cream packaged in cans
- ✱ Non-pre-packed plant-based dairy and meat substitutes (e.g. food sold loose at a self-serve deli counter)
- ✱ RTE and non-RTE composite food products that contain some plant-based dairy and/or meat substitutes (e.g. vegan pizzas, vegan sandwiches or salads etc.)

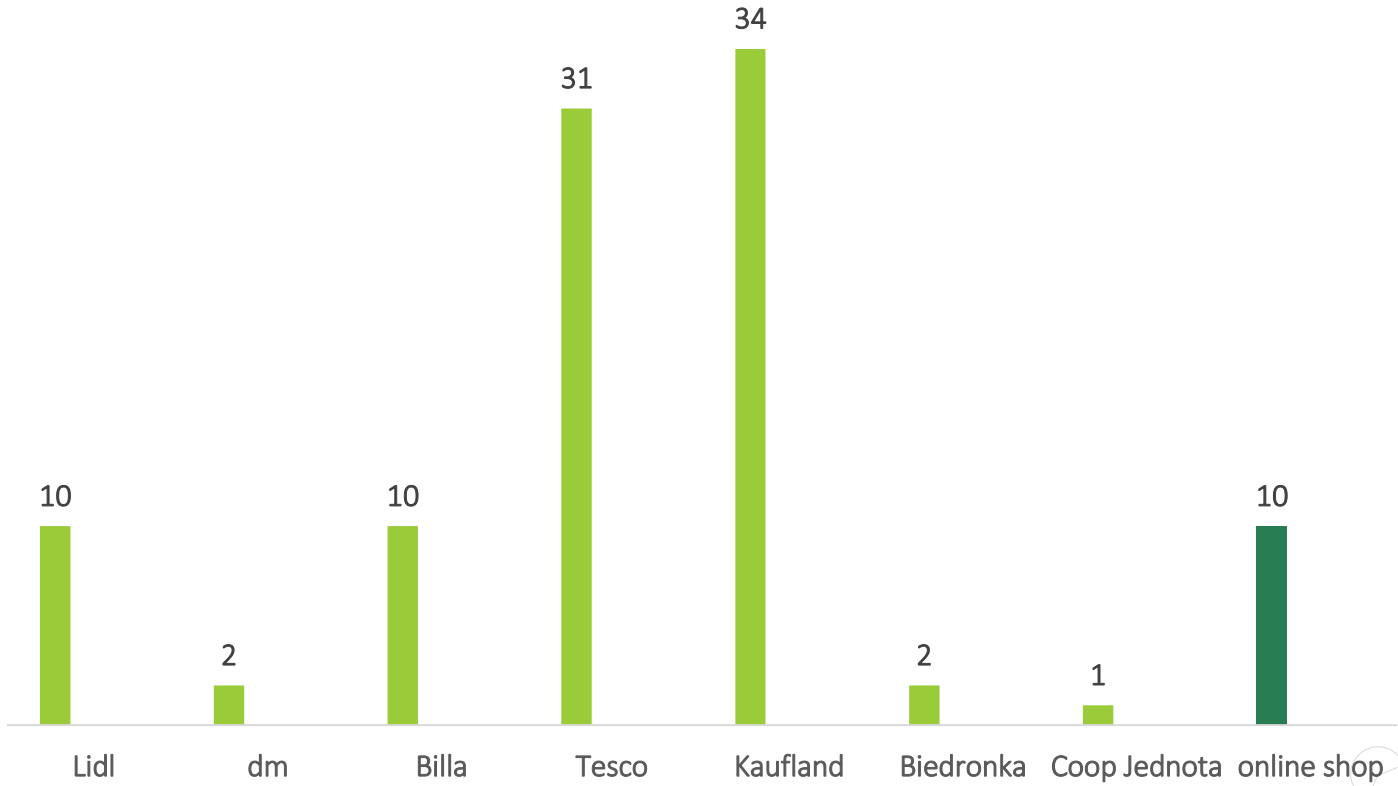
Odber vzoriek

- Rôzne šarže
- Rôzni výrobcovia
- Rôzne obchody
- RTE potraviny

slido.com #1051175







„mlieko“















alebo názov

„syry“


VEMONDO
5432
vegan
Goldessa
Classic
based on coconut oil
and almond protein
150 g


7572
LUNTER
NATURAL
TOFU
27 g PROTEÍNOV*
SÓJOVÉ BÔBY BEZ GMO
ZDROJ VÁPNIKA


VEMONDO
0733
vegan
Slices
Mediterranean
Style
aromatic slices
for tasty sandwiches
VEGAN
NUTRI-SCORE
A B C D E
without
soy & palm oil
150 g


NURISHH
ROSTLINNÉ PLÁTKY NA BURGER
RASTLINNÉ PLÁTKY NA BURGER
ROŚLINNE PLASTRY DO BURGERÓW
NÖVÉNYI ALAPÚ SZELETEK BURGEREKHEZ


Violife
100% Plant Based
7595
GREEN WHITE
block
free from DAIRY
SOYA · GLUTEN · LACTOSE
NUTS · PRESERVATIVES
Vegan
with VITAMIN B12
Serving suggestion

„Mäsové výrobky“















„ryby“

slido.com #1051175





Informácie o vzorkách – 1/2

Sample Number	Brand Name	Manufacturer	Sample Description on Packaging	English Translation	Ingredients	Category	Storage Type	Unit Weigh	Price	Country Origin
SK_065_7590	good Nature	Good Nature	rastlinný nárez Milano	vegan cuts Milano	wheat gluten 33%, soya beans,	Plant-Based Meat	Chilled	80g	7,92	Italy
SK_066_7591	Veganer aufschnitt klassik	Kupfer Innovative, Nemecko	Vegánsky nárez na báze repkového oleja a	Vegan cut based on rapeseed oil an	water, rapeseed oil (10%),pea protein (1,5%	Plant-Based Meat	Chilled	100g		Nemeck
SK_067_7592	nurishh	Bel group	vegánska potravinová špecialita na báze	vegan speciality based on coconut o	starch, water, coconut oil 10%, vitB12	Plant-Based Cheese	Chilled	150g	3,26	France
SK_068_7593	take it veggie	Soja Food Beckum	Bio tofu údené	Bio tofu smoked	soya, salt, beech wood smoke	Plant-Based Cheese	Chilled	350g	2,79	German
SK_069_7594	take it veggie	Soja Food Beckum	Bio tofu natur	Bio tofu natur	soya, water	Plant-Based Cheese	Chilled	400g	2,79	German
SK_070_7595	Violife	Arivia S.A	Violife grécky blok biely	Greek white block	coconut oil 29%, starch, vitB12	Plant-Based Cheese	Chilled	200g	3,99	Greece
SK_071_7596	Violife	Arivia S.A	Viofel plátky s údenou príchuťou	Viofel cuts with smoked aroma	starch, coconut oil 23%, aromas	Plant-Based Cheese	Chilled	100g	2,99	Greece
SK_072_7597	Veganer aufschnitt grillgemuse	Kupfer Innovative, Nemecko	Vegánsky nárez na báze repkového oleja a	Vegan cut based on rapeseed oil	water,grilled vegetables (15%), rapeseed	Plant-Based Meat	Chilled	100g		Nemeck
SK_073_7729	Riso Scotti	Riso Scotti	ryžový nápoj	Rice quinoa	rice 14%, quinoa 3%	Plant-Based Milk	Ambient	1 l	2,09	Italy
SK_074_7730	Oat LY	Oatly AB	Ovsený nápoj s pridanými vitamínmi a	Oat drink with added vitamins and n	water, oat(10%),rapeseed oil	Plant-Based Milk	Ambient	1L	2,59	Švédsko
SK_075_7731	Plant chef	Tesco	Rastlinná nátierka z tofu s cibuľou a sušeným	French type spread with onion and y	tofu 32%, soya beans, onion, yeasts	Plant-Based Cheese	Chilled	150g		SK
SK_076_7732	well well	Well Well Potraviny	dozrievajúce rastlinné plátky	ripening plant cuts	wheat gluten 34%	Plant-Based Meat	Chilled	80g		Czech re
SK_077_7733	Viodeli violife	Arivia S.A., Greece	Violife viodeli plátky s morčacou príchuťou	turkey flavour slices	water, coconut oil 20%, starch	Plant-Based Meat	Chilled	100g	3,15	Greece
SK_078_7734	Viodeli violife	Arivia S.A., Greece	Violife viodeli plátky s príchuťou šunky	Ham flavour slices	water, coconut oil 20%, starch	Plant-Based Meat	Chilled	100g	3,15	Greece
SK_079_7735	nurishh	Bel group	rastlinné plátky na burger	vegan slices for burger	coconut oil 23%, caroten, paprika	Plant-Based Cheese	Chilled	100g	2,55	France
SK_080_7736	nurishh	Bel group	rastlinné plátky na sendvič	vegan slices for sendwich	coconut oil 23%	Plant-Based Cheese	Chilled	100g	2,55	France
SK_081_7737	good calories	Mokate Slovakia s.r.o.	vegaánsky výrobok na rastliinej báze s hlivou	vegan product with oyster mushroon	mushroom 39%, gluten, wheat protein	Plant-Based Meat	Chilled	180g		CR
SK_082_7738	Radoma	Ryba Zilina	vegan nárez	vegan cuts	soya protein, citrus fiber	Plant-Based Meat	Chilled	100g	2,29	SK
SK_083_7945	Violife	Arivia S.A	Vuofel blok grécky biely rastlinný výrobok s	Viofel greek white plant product with	coconut oil 29%	Plant-Based Cheese	Chilled	200g	3,99	Greece
SK_084_7946	go Vege	Sokolow Podlaski	vegánsky rastlinný nárez so sójovou	Vegan plant based cut with soya pro	soya protein 3,3%, citrus fiber 2,3% green	Plant-Based Meat	Chilled	100g	3,98	PL
SK_085_7947	Viodeli Violife	Arivia S.A	Violife viodeli plátky s morčacou príchuťou	Turkey flavour slices	water, coconut oil (20%),starch	Plant-Based Meat	Chilled	100g	3,15	Greece
SK_086_7948	Violife	Arivia S.A	Violife plátky s príchuťou eidam	Edam flavour slices	water, coconut oil (23%),starch	Plant-Based Cheese	Chilled	100g	2,99	Greece
SK_087_7949	Radoma	Ryba Zilina	Rastlinný výrobok z drte sójových bôbov	Plant product made from soya bean	okara 21%, mustard	Plant-Based Fish	Chilled	140g	3,90	SK
SK_088_7950	Vege Story	Tarczynski	rastlinný výrobok piri-piri	plant product piri-piri	dry onion 21%, oyster mushroom root 15%,	Plant-Based Meat	Chilled	90g	2,58	Poland
SK_089_7951	soja product	Daniel Harušťák	sójový nárez	Soya cuts	26% soya beans, oil	Plant-Based Meat	Chilled	200g	1,55	SK
SK_090_8794	Sproud	Sproud International AB	Rastlinný nápoj z hrachovej bielkoviny s	Unsweetened pea protein drink with	water,protein from pea(1,9%), rapeseed oil	Plant-Based Milk	Ambient	1L	3,79	Švédsko
SK_091_8795	Sproud	Sproud International AB	Rastlinný nápoj z hrachovej bielkoviny s	Vanilla drink made from pea	water,sugar,protein from pea(1,9%),	Plant-Based Milk	Ambient	1L	3,79	Švédsko
SK_092_8796	Natumi	Natumi GmbH	Kešu nápoj prírodný	Cashew drink no added sugars	water,cashew (6%),sea salt	Plant-Based Milk	Ambient	1L	3,99	Nemeck
SK_093_8797	Dr.Goerg	Dr. Goerg GmbH	Kokosové mlieko	Coconut milk	coconut milk (100%)	Plant-Based Milk	Ambient	200ml	2,9	Nemeck
SK_094_8798	Natumi	Natumi GmbH	Mandľový nápoj nesladený	Unsweetened almond drink	water, almonds (4%)	Plant-Based Milk	Ambient	1L	3,99	Nemeck
SK_095_8799	Natumi	Natumi GmbH	Ovsený nápoj bezlepkový	Oat drink glutenfree	water, glutenfree oat flour(11,5%)	Plant-Based Milk	Ambient	1L	2,99	Nemeck
SK_096_8800	Natumi	Natumi GmbH	Pšenový nápoj prírodný	Wheat drink natur	water, wheat (15%)	Plant-Based Milk	Ambient	1L	3,89	Nemeck
SK_097_8801	Allos	Allos Hof-Manufaktur GmbH	Ryžový lieskovoorieškový nápoj	Rice hazelnut drink	water, rice (17%), hazelnut (3%)	Plant-Based Milk	Ambient	1L	3,99	Nemeck
SK_098_8802	Natumi	Natumi GmbH	Ryžový nápoj vanilkový	Rice driknk Vanilla,no added sugars	water, fermented rice (14%)	Plant-Based Milk	Ambient	1L	3,19	Nemeck
SK_099_8803	Dinkel	Natumi	Špaldové mlieko s mandľami	Spelt milk with almonds	water, whole grain fermented	Plant-Based Milk	Ambient	1L	3,85	Nemeck
SK_100_12547	Lunter	Originals s.r.o.	Tofu rastlinná nátierka s brusnicami,	Tofu vegetable spread with cranberr	24% tofu, 4 % cranberries,rapeseed oil	Plant-Based Meat	Chilled	150g	1,80	SK

Informácie o vzorkách - 2/2

ents	Category	Storage Type	Unit Weigh	Price	Country of Origin	Where was the sample taken	Type of Premises	Storage Instructions on label	Use By/Best Before	Date Labelled	Date Analy	Carried out
luten 33%, soya beans,	Plant-Based Meat	Chilled	80g	7,92	Italy	Kaufland Dolny	Supermarket	store at +0°C - +8°C	Use By Date	10.08.2025	08.08.2025	8588004552128
apeseed oil (10%),pea protein (1,5%	Plant-Based Meat	Chilled	100g		Nemecko	Kaufland	Supermarket	store at +0°C - +7°C	Best Before Date	26.7.2025	25.7.2025	4262360094136
water, coconut oil 10%, vitB12	Plant-Based Cheese	Chilled	150g	3,26	France	Kaufland Dolny	Supermarket	store at +2°C - +8°C	Use By Date	17.11.2025	4.11.2025	3073781178876
lt, beech wood smoke	Plant-Based Cheese	Chilled	350g	2,79	Germany	Kaufland Dolny	Supermarket	store at +4°C - +8°C	Use By Date	05.08.2025	05.08.2025	4335896750712
ater	Plant-Based Cheese	Chilled	400g	2,79	Germany	Kaufland Dolny	Supermarket	store at +4°C - +8°C	Use By Date	27.08.2025	27.08.2025	4335896750729
t oil 29%, starch, vitB12	Plant-Based Cheese	Chilled	200g	3,99	Greece	Kaufland Dolny	Supermarket	store at +2°C - +8°C	Use By Date	11.03.2026	4.11.2025	5202390020407
coconut oil 23%, aromas	Plant-Based Cheese	Chilled	100g	2,99	Greece	Kaufland Dolny	Supermarket	store at +2°C - +8°C	Use By Date	22.01.2026	4.11.2025	5202390023859
rilled vegetables (15%), rapeseed	Plant-Based Meat	Chilled	100g		Nemecko	Kaufland	Supermarket	store at +0°C - +7°C	Best Before Date	24.7.2025	24.7.2025	4262360094433
, quinoa 3%	Plant-Based Milk	Ambient	1 l	2,09	Italy	Tesco Poprad	Supermarket	once open, keep in fridge, use by 3-4	Best Before Date	01.09.2025	01.09.2025	8001860252938
at(10%),rapeseed oil	Plant-Based Milk	Ambient	1L	2,59	Švédsko	Tesco Poprad	Supermarket	once open, keep in fridge	Best Before Date	23.04.2026	06.11.2025	7394376621093
, soya beans, onion, yeasts	Plant-Based Cheese	Chilled	150g		SK	Tesco	Supermarket	store at +2°C - +8°C	Use By Date	23.07.2025	23.07.2025	5051007160780
luten 34%	Plant-Based Meat	Chilled	80g		Czech republic	Tesco Poprad	Supermarket	store at +2°C - +8°C	Use By Date	06.08.2025	06.08.2025	8594191744055
oconut oil 20%, starch	Plant-Based Meat	Chilled	100g	3,15	Greece	Tesco Poprad	Supermarket	store at +2°C - +8°C	Best Before Date	05.03.2026	06.11.2025	5202390028502
oconut oil 20%, starch	Plant-Based Meat	Chilled	100g	3,15	Greece	Tesco Poprad	Supermarket	store at +2°C - +8°C	Best Before Date	19.03.2026	06.11.2025	5202390028496
t oil 23%, caroten, paprika	Plant-Based Cheese	Chilled	100g	2,55	France	Tesco Poprad	Supermarket	store at +2°C - +8°C	Use By Date	31.10.2025	31.10.2025	3073781207248
t oil 23%	Plant-Based Cheese	Chilled	100g	2,55	France	Tesco Poprad	Supermarket	store at +2°C - +8°C	Use By Date	01.09.2025	01.09.2025	3073781207262
om 39%, gluten, wheat protein	Plant-Based Meat	Chilled	180g		CR		Supermarket	store at +0°C - +8°C	Use By Date	28.07.2025	28.07.2025	8595014601036
otein, citrus fiber	Plant-Based Meat	Chilled	100g	2,29	SK	Tesco Poprad	Supermarket	store at +1°C - +4°C	Use By Date	02.08.2025	01.08.2025	8588000604128
t oil 29%	Plant-Based Cheese	Chilled	200g	3,99	Greece	Tesco Liptovsky	Supermarket	store at +2°C - +8°C	Use By Date	21.04.2026	4.11.2025	5202390020407,00
otein 3,3%, citrus fiber 2,3% green	Plant-Based Meat	Chilled	100g	3,98	PL	Biedronka Liptovsky	Supermarket	store at +1°C - +6°C	Use By Date	30.07.2025	30.07.2025	5900562689819
oconut oil (20%),starch	Plant-Based Meat	Chilled	100g	3,15	Greece	Tesco Liptovsky	Supermarket	store at +2°C - +8°C	Best Before Date	31.03.2026	06.11.2025	5202390028502,00
oconut oil (23%),starch	Plant-Based Cheese	Chilled	100g	2,99	Greece	Tesco Liptovsky	Supermarket	store at +2°C - +8°C	Best Before Date	10.02.2026	06.11.2025	5202390028823,00
1%, mustard	Plant-Based Fish	Chilled	140g	3,90	SK	Tesco Liptovsky Miku	Supermarket	store at +1°C - +6°C	Use By Date	02.08.2025	01.08.2025	8588000604210
n 21%, oyster mushroom root 15%,	Plant-Based Meat	Chilled	90g	2,58	Poland	Biedronka Liptovsky	Supermarket	store at +2°C - +25°C	Use By Date	04.09.2025	04.09.2025	5908230530273
a beans, oil	Plant-Based Meat	Chilled	200g	1,55	SK	Tesco Liptovsky	Supermarket	store at +2°C - +8°C	Use By Date	24.9.2025	24.9.2025	8588002767326,00
rotein from pea(1,9%), rapeseed oil	Plant-Based Milk	Ambient	1L	3,79	Švédsko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated up	Use By Date	01.02.2026	10.11.2025	7340150800444,00
ugar,protein from pea(1,9%),	Plant-Based Milk	Ambient	1L	3,79	Švédsko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated up	Best Before Date	27.03.2026	10.11.2025	7340150800758,00
ashew (6%),sea salt	Plant-Based Milk	Ambient	1L	3,99	Nemecko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated and	Best Before Date	29.04.2026	10.11.2025	9020200031889,00
t milk (100%)	Plant-Based Milk	Ambient	200ml	2,9	Nemecko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated and	Best Before Date	23.07.2026	10.11.2025	4260213395232,00
lmonds (4%)	Plant-Based Milk	Ambient	1L	3,99	Nemecko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated and	Best Before Date	08.04.2026	10.11.2025	4038375025928,00
lutenfree oat flour(11,5%)	Plant-Based Milk	Ambient	1L	2,99	Nemecko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated and	Best Before Date	26.03.2026	10.11.2025	4038375025461,00
wheat (15%)	Plant-Based Milk	Ambient	1L	3,89	Nemecko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated and	Best Before Date	09.04.2026	10.11.2025	403837502587,00
ice (17%), hazelnut (3%)	Plant-Based Milk	Ambient	1L	3,99	Nemecko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated and	Best Before Date	04.06.2026	10.11.2025	4016249218218,00
ermented rice (14%)	Plant-Based Milk	Ambient	1L	3,19	Nemecko	Bioveci Bratislava	Online healthfood shop	once opened, keep refrigerated and	Best Before Date	25.02.2026	10.11.2025	4038375025102,00
whole grain fermented	Plant-Based Milk	Ambient	1L	3,85	Nemecko	Bioveci Bratislava	Online healthfood shop	once open, keep in fridge use by 4	Best Before Date	08.11.2025	07.11.2025	4,03838E+12

Výsledkový formulár

Sample Number	pH	Water Activity (a_w)	L. monocytogenes (enumeration)	L. monocytogenes (detection)	Listeria spp. (enumeration)	Listeria spp. (detection)	Salmonella spp. (detection)	E.coli (enumeration)	Shi
SK_064_7589	5,09	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_065_7590	4,82	0,95	<10	not detected	<10	not detected	not detected	<10	
SK_066_7591	5,36	0,97	<10	not detected	<10	not detected	not detected	<10	
SK_067_7592	4,61	0,92	<10	not detected	<10	not detected	not detected	<10	
SK_068_7593	5,91	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_069_7594	5,90	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_070_7595	3,05	0,95	<10	not detected	<10	not detected	not detected	<10	
SK_071_7596	4,07	0,95	<10	not detected	<10	not detected	not detected	<10	
SK_072_7597	5,15	0,97	<10	not detected	<10	not detected	not detected	<10	
SK_073_7729	6,47	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_074_7730	7,21	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_075_7731	5,70	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_076_7732	5,37	0,96	<10	not detected	<10	not detected	not detected	<10	
SK_077_7733	5,28	0,97	<10	not detected	<10	not detected	not detected	<10	
SK_078_7734	5,31	0,97	<10	not detected	<10	not detected	not detected	<10	
SK_079_7735	4,56	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_080_7736	4,44	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_081_7737	5,90	0,97	<10	not detected	<10	not detected	not detected	<10	
SK_082_7738	5,07	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_083_7945	3,05	0,95	<10	not detected	<10	not detected	not detected	<10	
SK_084_7946	4,73	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_085_7947	5,27	0,97	<10	not detected	<10	not detected	not detected	<10	
SK_086_7948	3,77	0,95	<10	not detected	<10	not detected	not detected	<10	
SK_087_7949	4,10	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_088_7950	5,02	0,78	<10	not detected	<10	not detected	not detected	<10	
SK_089_7951	5,94	0,98	<10	not detected	<10	not detected	not detected	<10	
SK_090_8794	7,76	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_091_8795	7,67	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_092_8796	7,08	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_093_8797	6,31	0,98	<1	not detected	<1	not detected	not detected	<1	
SK_094_8798	7,23	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_095_8799	6,40	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_096_8800	6,74	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_097_8801	6,41	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_098_8802	6,55	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_099_8803	6,43	0,99	<1	not detected	<1	not detected	not detected	<1	
SK_100_12547	5,12	0,98	<10	not detected	<10	not detected	not detected	<10	



2026

A retail prevalence study to investigate microbiological contamination levels in ready-to-eat (RTE) plant-based dairy and meat substitutes

FINAL NATIONAL REPORT for Slovakia

Funded by the European Food Safety Authority Focal Point Tailor-made activities

Physico-chemical characteristics of the samples collected

Concerning pH values : Most samples belong to category with pH 6.1-7.0 (52/100, 52%, mainly meat substitutes), pH≤ 4.4 were 36/100, mainly plant-based cheese substitutes. 5 samples have pH ranged between 4.5 -5 and 7 of them have pH more than 7.

Fish sample has pH lower than 4.4. and aw between 0.97-0.98.

Regarding water activity results, 30/100 (30%) samples had the a_w value higher than 0.99. 56/100 (56%) samples had aw in range 0,97-0,98. Only 9 products had an a_w value of 0.95–0.96, and only two products had a_w between 0,93- 0.94. Only 3 products had aw below 0,92.

Table 3 pH of ready-to-eat plant-based dairy and meat substitutes tested Slovakia

Sample type	Total no. tested	Main plant-based ingredient	No. of products tested	No. of samples				
				pH ≤4.4	pH ranged from 4.5 to ≤5	pH ranged from 5.1 to ≤6	pH ranged from 6.1 to ≤7	pH >7
Dairy milk substitute	25	Almond	4				3	1
		Coconut	4				3	1
		Oats	5				3	2
		Soya	1				1	
		Rice	5				5	
		wheat	1				1	
		Cashew	1					1

		peas	2					2
		millet	1				1	
		spelt	1				1	
		>2 plant-based ingredients						
Dairy cream substitute	0	Coconut	0					
Cheese substitute	37	soya	22	21			1	
		Coconut	15	12	3	2		
		>2 plant-based ingredients						
Meat substitute	37	Soya	11		1	10		
		Tofu	6			6		
		wheat	7	2	1	4		
		peas	3	1		2		
		coconut	5			5		
		mushroom	3			3		
		rapeseed	2			2		
		>2 plant-based ingredients						
Fish substitute	1	Soya	1	1				

Shellfish substitute	Not applicable							

Table 4 a_w of ready-to-eat plant-based dairy and meat substitutes tested in Slovakia

Sample type	Total no. tested	Main plant-based ingredient	No. of products	No. of samples				
				a_w ≤0.92	a_w ranged from 0.93 to ≤0.94	a_w ranged from 0.95 to ≤0.96	a_w ranged from 0.97 to ≤0.98	a_w ≥0.99
Dairy milk substitute	25	Almond	4					4
		Coconut	4				1	3
		Oats	5					5
		Soya	1					1
		Rice	5				1	4
		wheat	1					1
		Cashew	1					1
		Millet	1					1
		Spelt	1					1
		peas	2					2

		>2 plant-based ingredients						
Dairy cream substitute	0	Coconut						
Cheese substitute	37	soya	22				16	6
		Coconut	15	1		6	8	
		>2 plant-based ingredients						
Meat substitute	37	Soya	11		1		9	1
		Tofu	6				6	
		wheat	7	1	1	2	3	
		peas	3				3	
		coconut	5				5	
		Mushroom	3	1		1	1	
		rapeseed	2				2	
		>2 plant-based ingredients						
Fish substitute	1	Soya	1				1	
Shellfish substitute	Not applicable							

LM – dôkaz / počet

Table 5 Results of detection method for *L. monocytogenes* in ready-to-eat plant-based dairy and meat substitutes tested in Slovakia

Sample type	Total no. tested	Main plant-based ingredient	No. of products	No. of samples	
				L. monocytogenes not detected in 25 g	*L. monocytogenes* detected in 25 g
				Satisfactory	Unsatisfactory
Dairy milk substitute	25	Almond	4	4	0
		Coconut	4	4	0
		Oats	5	5	0
		Soya	1	1	0
		Rice	5	5	0
		wheat	1	1	0
		Cashew	1	1	0
		Millet	1	1	0
		Spelt	1	1	0
		peas	2	2	0
		>2 plant-based ingredients			

Dairy cream substitute	0	Coconut	0	0	
Cheese substitute	37	soya	22	22	0
		Coconut	15	15	0
		>2 plant-based ingredients			
Meat substitute	37	Soya	11	11	0
		Tofu	6	6	0
		wheat	7	7	0
		peas	3	3	0
		coconut	5	5	0
		Mushroom	3	3	0
		rapeseed	2	2	0
		>2 plant-based ingredients			
Fish substitute	1	Soya	1	1	0
Shellfish substitute	Not applicable				

Dairy milk substitute	25	Almond	4	4	0	0
		Coconut	4	4	0	0
		Oats	5	5	0	0
		Soya	1	1	0	0
		Rice	5	5	0	0
		wheat	1	1	0	0
		Cashew	1	1	0	0
		Millet	1	1	0	0
		Spelt	1	1	0	0
		peas	2	2	0	0
		>2 plant-based ingredients				
Dairy cream substitute	0	Coconut	0			
Cheese substitute	37	soya	22	21	1	0
		Coconut	15	15	0	0
		>2 plant-based ingredients				
Meat substitute	37	Soya	11	10	1	0
		Tofu	6	5	1	0
		wheat	7	6	1	0
		peas	3	1	2	0
		coconut	5	5	0	0
		Mushroom	3	2	1	0
		rapeseed	2	0	0	0
		>2 plant-based ingredients				
Fish substitute	1	Soya	1	0	0	0
Shellfish substitute	Not applicable					

Table 10 Details of ready-to-eat plant-based dairy and meat substitutes in which *Listeria* spp. (non-*monocytogenes*) was detected and/or enumerated

Sample ID and sample type	Sample description	Ingredients	Storage conditions before and after opening	Best Before or Use By Date	Retail stage	Test results
						Listeria spp. enumeration method
SK_059_7584	Sausage exclusice spicy	Soya, chilli, rice flour, pea protein	Store at +2 - +6°C	Use by date	supermarket	10 cfu/g
SK_055_7580	Klobana smoked spicy	Chickpeas, brown rice, gluten free oat flour	Store at +0 - +8°C	Use by date	supermarket	10 cfu/g
SK_030_7554	Vegan product with oyster mushroom	Oyster moshroom, gluten, wheat protein	Store at +0 - +8°C	Use by date	supermarket	10cfu/g
SK_036_7560	Tofu spread with roast pork	Soya beans, roasted onion	Store at +2 - +8°C	Use by date	supermarket	10 cfu/g
SK_044_7569	Tofu for greek style	Tofu, soya beans, brain	Store at +2 - +8°C	Use by date	supermarket	10 cfu/g
SK_056_7581	Hungary sausage smoked	Wheat, soya, barley, paprika	Store at +0 - +8°C	Use by date	supermarket	10 cfu/g
SK_057_7582	Hungary sausage smoked spicy	Wheat, soya, spicy paprika	Store at +0 - +8°C	Use by date	supermarket	20 cfu/g

Záver :

slido.com #1051175

- Jeden z mála projektov zameraných na náhrady živočíšnych produktov
- Mikrobiologická kvalita vo výrobkoch dostupných na Slovensku :

  ukazovatele bezpečnosti :

  - ***Salmonella*** - neprítomná
  - ***Listeria monocytogenes*** – neprítomná

  Ukazovatele hygieny procesu

  - **Počty *Escherichia coli*** – 0/100
  - **Počty Listeria spp.** – 7/100 - do 100 KTJ/g

  Takmer všetky vyšetrované RTE potraviny – „čisté misky“

  Najviac saprofytickej mikroflóry v UHT mliekach

slido.com #1051175

ďakujem za pozornosť

lenka.cabanova@svpu.sk



Tento projekt bol hradený z grantu MPaRV SR č. 35/2710-EFSA