BIOR · A FOOD SAFETY GAME

You are the risk assessor

The printable game · Rules

RISK = **HOW SERIOUS** × **HOW OFTEN**

The game shows how risk assessors judge food risks, and why the real risk is often not where we expect it. Anyone who buys, cooks or eats food, from about age 10. No prior knowledge needed.

Play online too: **riskuspele.bior.lv**

What you need

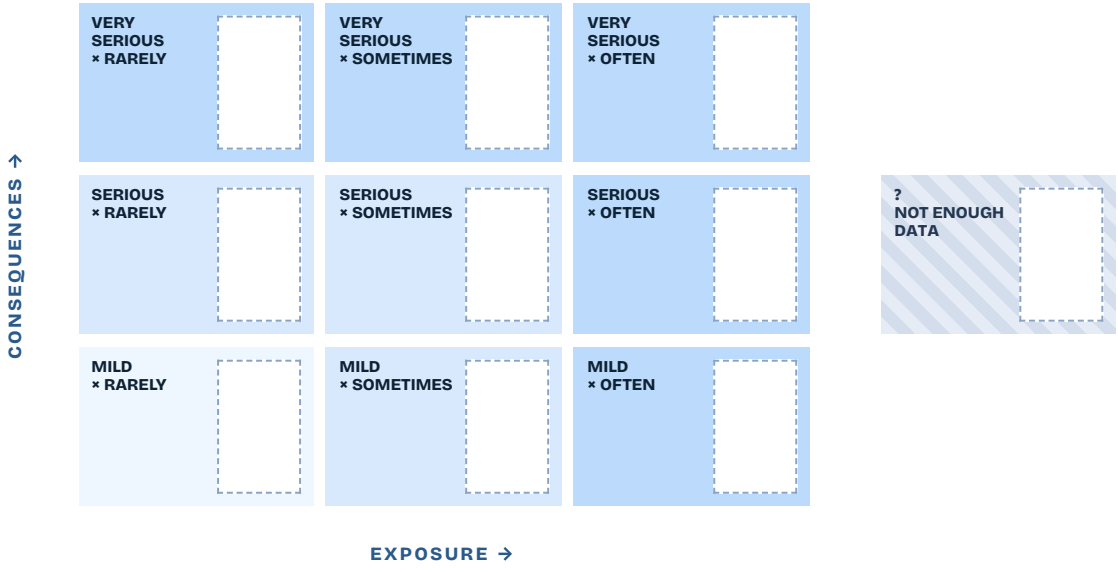
- A printer and A4 paper. Thicker paper suits the cards, 160–250 g/m².
- Scissors or a paper cutter.
- One or more players or teams.

How to print

- Print this file (rules, board and answers) single-sided, and the cheat sheets too if you want them.
- Print the cards file double-sided, flipping on the long edge. If your printer cannot print on both sides, print the odd pages, put them back in the printer the other way up and print the even pages.
- Print at 100 % (actual size), not “fit to page”.
- Cut along the dashed lines through the middle: a card sheet gives 4 cards, a board sheet 2 squares. If you like, trim the white frame off the cards along the grey line. Each card's number is on its back too, so you can check that the two sides match.

Set up the board

Lay the nine squares out on a table as in the picture: up means more serious consequences, right means more often. Put the “Not enough data” square beside them. Shuffle the cards and stack them face up.



How to play

1 Read the card.

WHAT IT DOES tells you about the consequences. WHERE IT IS FOUND, HOW OFTEN IT IS FOUND and HOW OFTEN IT IS EATEN together tell you how often and how much we meet it.

2 Put it on the square where you think it belongs.

Judge how it ends for the people it affects, at the amounts we actually take in. A rare exception does not count, but a severe outcome for one group, such as small children or pregnant women, does. On a hazard card, frequency is both lines together: how often it is found in food and how often it is eaten. If there is not enough data, put the card on “Not enough data”. One square can hold several cards.

3 Turn the cards over.

When every card is down, turn them over. The back shows where the risk assessors put them, and why.

What the rows and columns mean

CONSEQUENCES ↑ VERY SERIOUS

Can cause permanent damage or be fatal.

CONSEQUENCES ↑ SERIOUS

May need treatment or a hospital, or can harm health over the longer term.

CONSEQUENCES ↑ MILD

Usually passes on its own within days, with no lasting harm.

EXPOSURE → RARELY

Few people meet it, rarely or in small amounts.

EXPOSURE → SOMETIMES

Some people meet it now and then.

EXPOSURE → OFTEN

Almost everyone meets it regularly, even daily.

? NOT ENOUGH DATA

Put it here if there is not enough data to assess the risk

Points, if you keep score

Spot on	**100**
Next square	**50**
Diagonal square	**25**

A card that belongs on “Not enough data” scores only there. A card on “Not enough data” that belongs on the matrix scores nothing.

A cheat sheet takes no points off.

Tips

- Start with five or six cards, not all of them at once.
- Teams first agree on a square and say why, and only then turn the card over.
- If a card seems too hard, look its number up in the cheat sheets.

Each card's square is based on published risk assessments: the Finnish Food Authority (Ruokavirasto 1/2021), the Norwegian Scientific Committee for Food and Environment (VKM 2019:13, 2021:10), EFSA and ECDC (2024), and the Technical University of Denmark (DTU, 2023). The frame of reference is a person in Europe, Latvia included, today. They are well-founded starting points for a conversation, not a formal risk assessment.

Game by Jānis Ruško, BIOR. The game was made within research application No. 1.1.1.9/LZP/1/24/124 “From Data to Decisions: Smart Tools for Food Safety Risk Assessment and Prioritization” at the Institute of Food Safety, Animal Health and Environment “BIOR”.

Illustrations on some of the cards: Elīna Blekte-Gerāne, from the EFSA #Safe2EatEU campaign activity book “Kur slēpjas Baktiņi?” (2024), run in Latvia by BIOR. Used with permission. All other drawings and the chemical structures were made for this game.

Co-funded by the European Union

2027 National Development Plan

PostDoc Latvia

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VERY SERIOUS

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✖

EXPOSURE →

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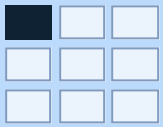

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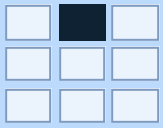

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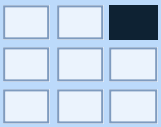

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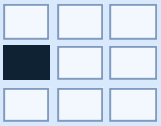

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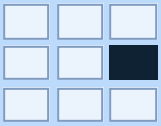

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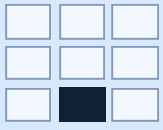

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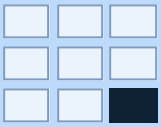

CARDS HERE

?

NOT ENOUGH DATA

Put it here if there is not enough data to assess the risk

How well do we know it?

CARDS HERE

Answers · 01–60

Where the risk assessors put each card. The back of the card says why.

No.	Card	Square
01	Campylobacter	☐ **Serious × Sometimes**
02	Salmonella	☐ **Serious × Rarely**
03	Listeria monocytogenes	☐ **Very serious × Rarely**
04	Norovirus	☐ **Mild × Often**
05	Toxoplasma gondii	☐ **Very serious × Sometimes**
06	Shiga toxin-producing E. coli	☐ **Very serious × Rarely**
07	Yersinia enterocolitica	☐ **Serious × Rarely**
08	Hepatitis E virus	☐ **Mild × Sometimes**
09	Anisakis: fish parasites	☐ **Serious × Rarely**
10	Cereulide	☐ **Mild × Sometimes**
11	Bird flu in eggs, meat and milk	☐ **Very serious × Rarely**
12	Vibrio bacteria in seafood	☐ **Serious × Rarely**
13	Cronobacter: bacteria in formula powder	☐ **Very serious × Rarely**
14	Staphylococcal toxins	☐ **Mild × Sometimes**
15	African swine fever	☐ **Mild × Rarely**
16	Fox tapeworm	☐ **Very serious × Rarely**
17	Tick-borne encephalitis from raw milk	☐ **Very serious × Rarely**
18	Aflatoxins	☐ **Very serious × Rarely**
19	Deoxynivalenol (DON)	☐ **Mild × Often**
20	T-2 and HT-2 toxins	☐ **Serious × Sometimes**
21	Ochratoxin A	☐ **Serious × Sometimes**
22	Patulin	☐ **Mild × Rarely**
23	Alternaria toxins	☐ **Serious × Often**
24	Ergot alkaloids	☐ **Serious × Sometimes**
25	Acrylamide	☐ **Serious × Often**
26	Furan	☐ **Serious × Sometimes**
27	Benzo(a)pyrene and PAHs	☐ **Serious × Sometimes**
28	Glycidyl esters	☐ **Serious × Sometimes**
29	Nitrosamines	☐ **Serious × Often**
30	Lead	☐ **Serious × Often**

No.	Card	Square
31	Cadmium	☐ **Mild × Often**
32	Inorganic arsenic	☐ **Very serious × Sometimes**
33	Methylmercury	☐ **Serious × Rarely**
34	Lead shot in game	☐ **Serious × Rarely**
35	PFAS (“forever chemicals”)	☐ **Serious × Often**
36	Dioxins and dl-PCBs	☐ **Serious × Often**
37	Eggs from backyard hens	☐ **Serious × Sometimes**
38	Histamine	☐ **Mild × Rarely**
39	Nitrate	☐ **Mild × Often**
40	Pesticide residues	☐ **Mild × Sometimes**
41	Glutamate (E621)	☐ **Mild × Often**
42	Peanut allergy	☐ **Very serious × Rarely**
43	Aspartame	☐ **Mild × Sometimes**
44	Microplastics	☐ **Not enough data**
45	Titanium dioxide (E171)	☐ **Not enough data**
46	Cyanogenic glycosides	☐ **Mild × Rarely**
47	Pyrrolizidine alkaloids	☐ **Very serious × Sometimes**
48	Tropane alkaloids	☐ **Serious × Rarely**
49	Polyols (sugar alcohols)	☐ **Mild × Sometimes**
50	Chemicals from packaging and tableware	☐ **Mild × Often**
51	6PPD-quinone	☐ **Not enough data**
52	Cinnamon and coumarin	☐ **Mild × Sometimes**
53	Vitamin D overdose	☐ **Very serious × Rarely**
54	Shellfish toxins	☐ **Very serious × Rarely**
55	Green and sprouted potatoes	☐ **Mild × Sometimes**
56	False morels	☐ **Very serious × Rarely**
57	Slush ice drinks with glycerol	☐ **Serious × Rarely**
58	Glyphosate	☐ **Mild × Sometimes**
59	Antibiotic residues in meat and milk	☐ **Mild × Rarely**
60	Butterfish (escolar)	☐ **Mild × Rarely**

Answers · 61–120

No.	Card	Square
61	Blue-green algae toxins	**Not enough data**
62	Poppy seeds	**Mild × Sometimes**
63	Seaweed and iodine	**Serious × Rarely**
64	Jelly sweets with HHC	**Serious × Rarely**
65	Cannabidiol (CBD) oil	**Not enough data**
66	Bisphenol A	**Serious × Often**
67	Sulphites	**Mild × Often**
68	Liver during pregnancy	**Very serious × Rarely**
69	Gluten and coeliac disease	**Serious × Rarely**
70	Liquorice	**Serious × Rarely**
71	Treated citrus peel	**Mild × Sometimes**
72	Food fraud	**Mild × Sometimes**
73	Azo dyes in sweets	**Mild × Sometimes**
74	Undercooked chicken	**Serious × Often**
75	Self-hunted game	**Very serious × Rarely**
76	One board for meat and salad	**Serious × Often**
77	Unwashed hands	**Mild × Often**
78	Cooked too brown	**Serious × Often**
79	Washing chicken before cooking	**Serious × Sometimes**
80	Unwashed salad and berries	**Mild × Often**
81	Frozen berries straight from the freezer	**Mild × Sometimes**
82	Raw milk	**Very serious × Rarely**
83	Mushrooms you picked yourself	**Very serious × Rarely**
84	Undercooked burger	**Very serious × Sometimes**
85	Energy drinks	**Not enough data**
86	Leftovers left out	**Mild × Sometimes**
87	Thawing meat on the counter	**Mild × Often**
88	Frozen breaded chicken	**Serious × Rarely**
89	Frozen vegetables, uncooked	**Very serious × Rarely**
90	Raw dough	**Very serious × Sometimes**

No.	Card	Square
91	Eating food past its “use by” date	**Very serious × Rarely**
92	Eating food past its “best before” date	**Mild × Often**
93	Scraping off the mould	**Not enough data**
94	Charred barbecue meat	**Serious × Sometimes**
95	Several supplements at once	**Very serious × Rarely**
96	Honey for babies	**Very serious × Rarely**
97	Home-canned food	**Very serious × Rarely**
98	Well water	**Serious × Sometimes**
99	Wild garlic and its poisonous look-alikes	**Very serious × Rarely**
100	Undercooked kidney beans	**Mild × Rarely**
101	A bitter courgette or pumpkin	**Mild × Rarely**
102	Green tea extract in capsules	**Serious × Rarely**
103	The extra-hot chip challenge	**Mild × Rarely**
104	Whole grapes and nuts for a small child	**Very serious × Rarely**
105	Very hot tea and coffee	**Serious × Sometimes**
106	The “fat burner” DNP	**Very serious × Rarely**
107	Fennel tea for a baby	**Serious × Sometimes**
108	Raw eggs	**Serious × Rarely**
109	Lead from petrol	**Very serious × Often**
110	Methylmercury in Minamata	**Very serious × Often**
111	Cadmium in Toyama rice	**Very serious × Often**
112	Melamine in infant formula	**Very serious × Often**
113	Ergotism epidemic	**Very serious × Often**
114	Methanol in Pärnu	**Very serious × Often**
115	“Mad cow disease”	**Very serious × Often**
116	E. coli in sprouts	**Very serious × Often**
117	Radioactive iodine in milk	**Very serious × Often**
118	The toxic oil of Spain	**Very serious × Often**
119	Lead in cinnamon apple purée	**Very serious × Often**
120	Listeriosis in South Africa	**Very serious × Often**