„Bez glutena “ – trend ili stvarna potreba?

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Vitaminoteka Zagreb

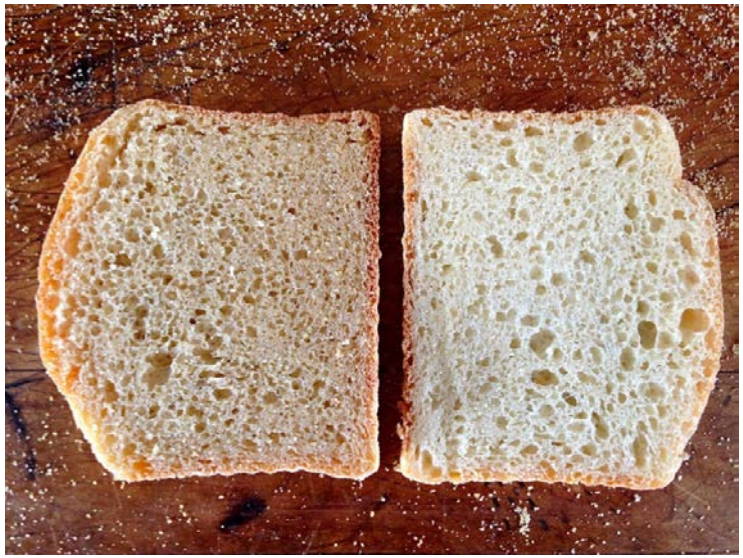
SAMO ZA ZDRAVSTVENE RADNIKE

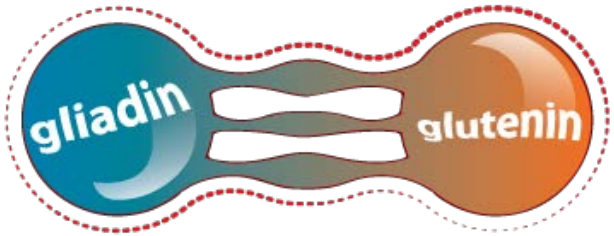
- Prezentirani sadržaj predstavlja stručni pregled teme i/ili vlastito kliničko iskustvo predavača. PLIVA Hrvatska d.o.o. preporuča primjenu lijekova u odobrenim indikacijskim područjima. Predavač ovime potvrđuje da su svi navodi o lijeku unutar prezentacije u skladu s navodima iz zadnje odobrene upute i sažetka opisa svojstava lijeka u Republici Hrvatskoj. Prije propisivanja bilo kojeg lijeka potrebno je pažljivo proučiti zadnji odobreni sažetak opisa svojstava lijeka.

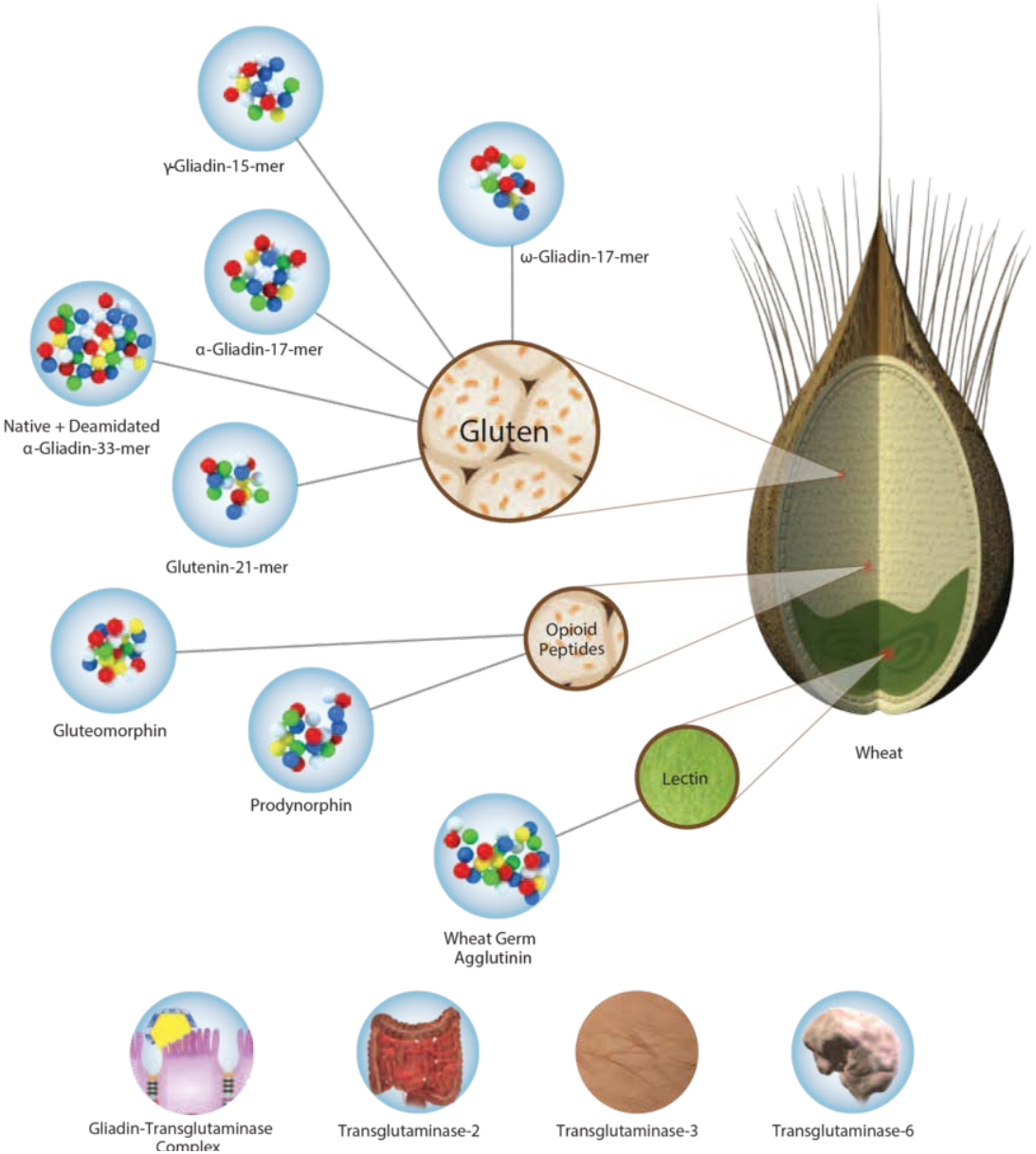
glu·ten

/ˈgl(o͞o)tn/ *noun*

1. a substance present in cereal grains, especially wheat, that is responsible for the elastic texture of dough. A mixture of two proteins, it causes illness in people with celiac disease.







Gluten

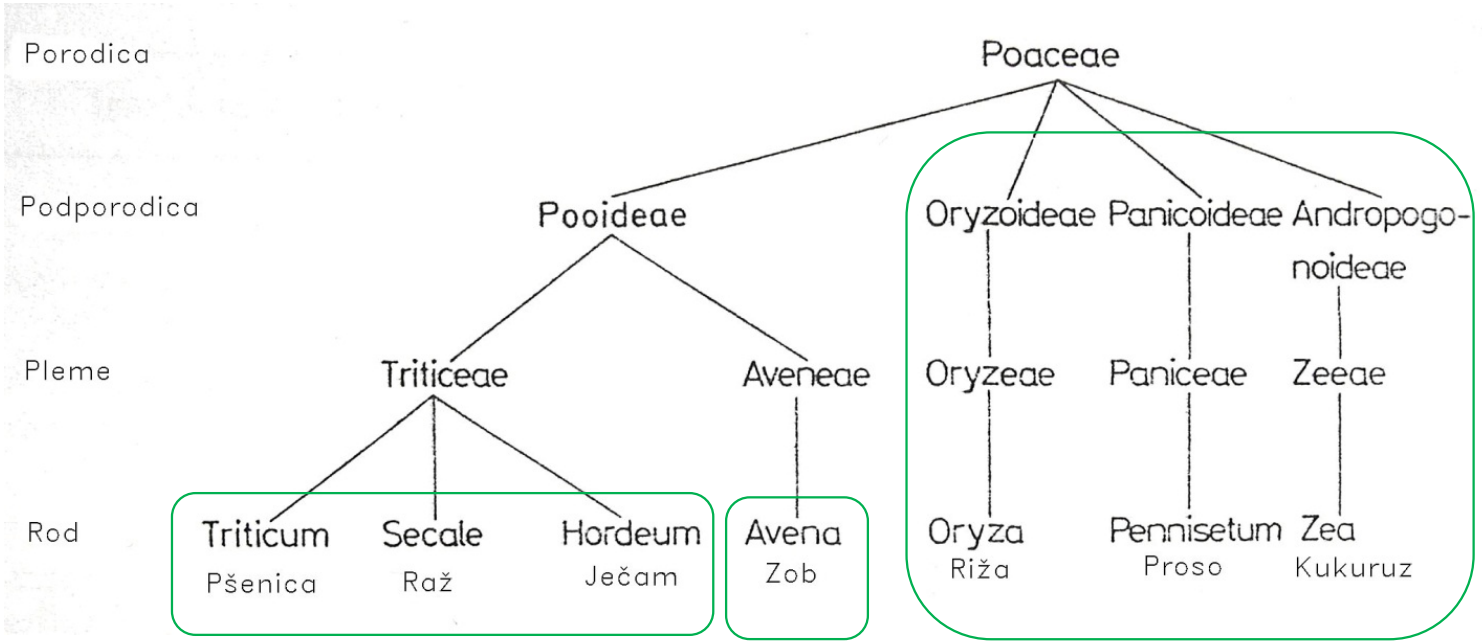
- Osnovni skladišni protein pšenice
- Proteini glutena imaju kompleksna kemijska svojstva: odgovorni su za kohezivnost, viskoznost i elastičnost tijesta
- vezuje masnoću i vodu, emulgira, stabilizira i izvrstan je nositelj aroma i začina.
- **Sveprisutan! – nalazi se u 70% industrijski proizvedenih prehrambenih proizvoda**

Phil. Trans. R. Soc. Lond. B (2002) ***357, 133–142***

Proteini koji sadrže gluten

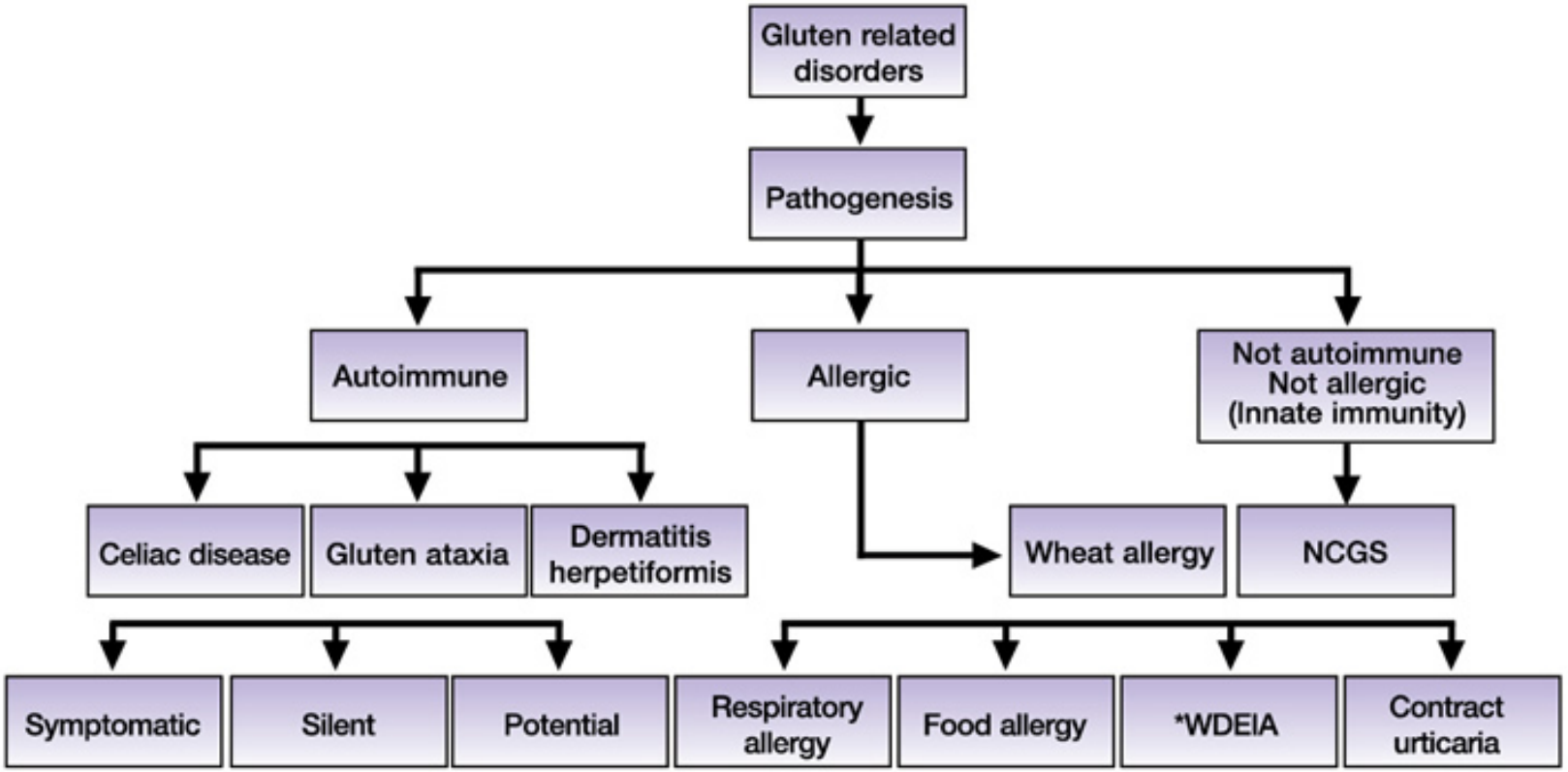
ALI i: emmer, kamut, pšenoraž, pir!

ŽITARICE – PODJELA



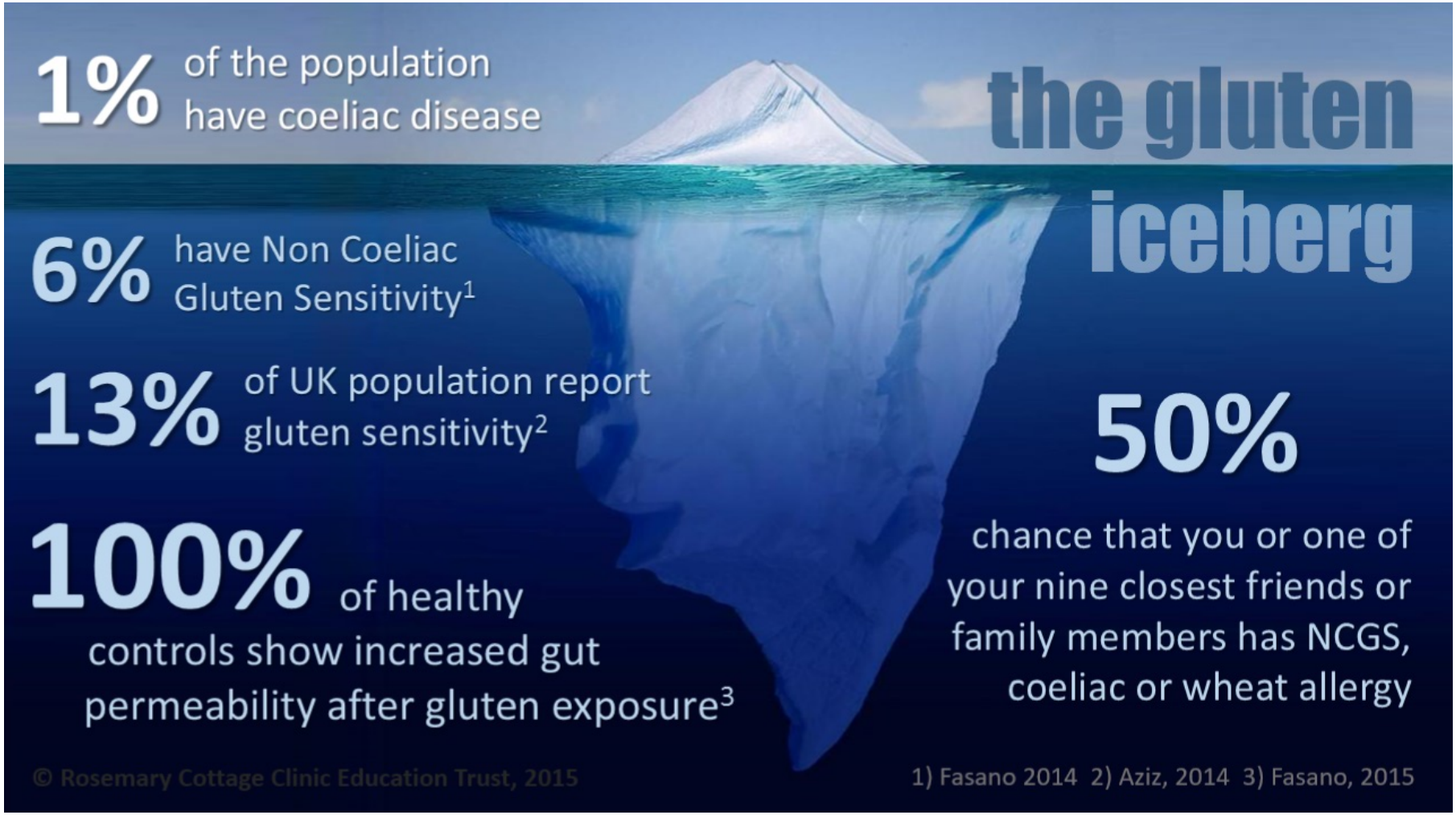
Filogeneza žitarica (Belitz et al. 2004)

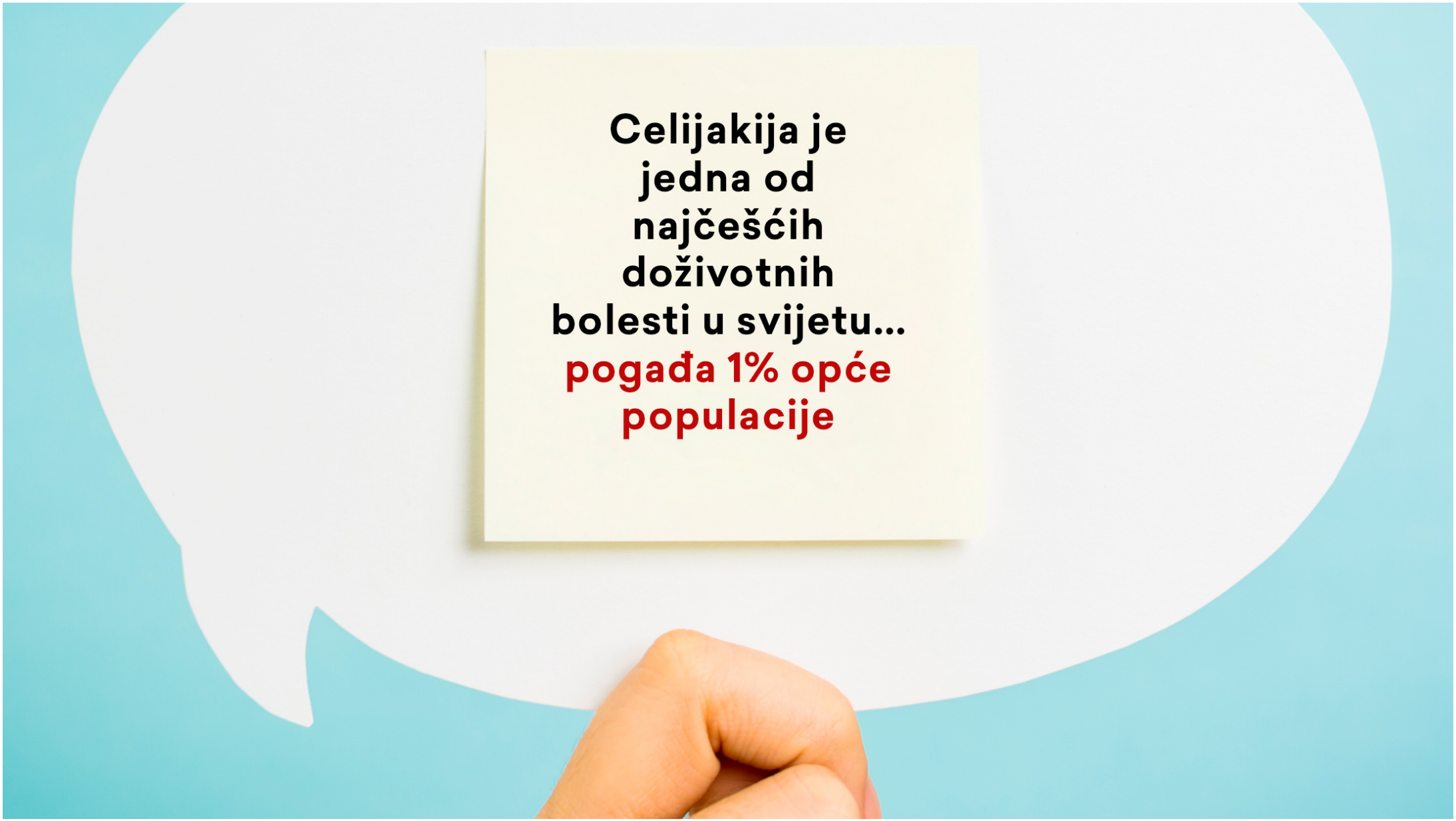
Classification of Gluten-Related Disorders



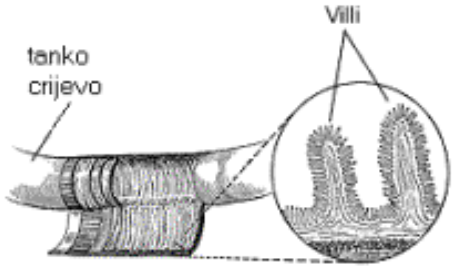
*WDEIA, wheat-dependent induced anaphylaxis

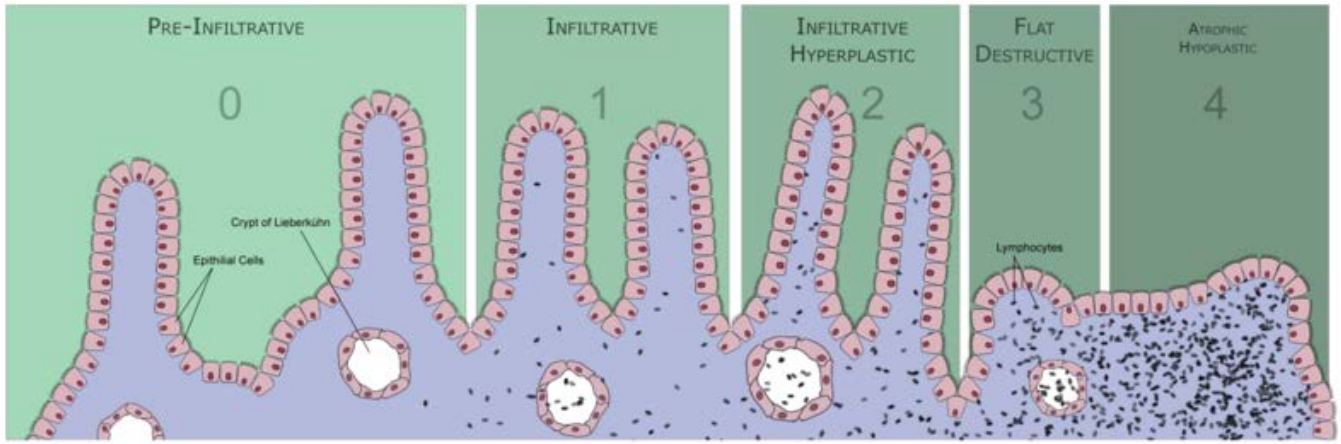
Adapted from: Nonceliac Gluten and Wheat Sensitivity, Gastroenterology 2015


1% of the population have coeliac disease
the gluten iceberg
6% have Non Coeliac Gluten Sensitivity[1]
13% of UK population report gluten sensitivity[2]
50%
chance that you or one of your nine closest friends or family members has NCGS, coeliac or wheat allergy
100% of healthy controls show increased gut permeability after gluten exposure[3]
© Rosemary Cottage Clinic Education Trust, 2015
1) Fasano 2014 2) Aziz, 2014 3) Fasano, 2015

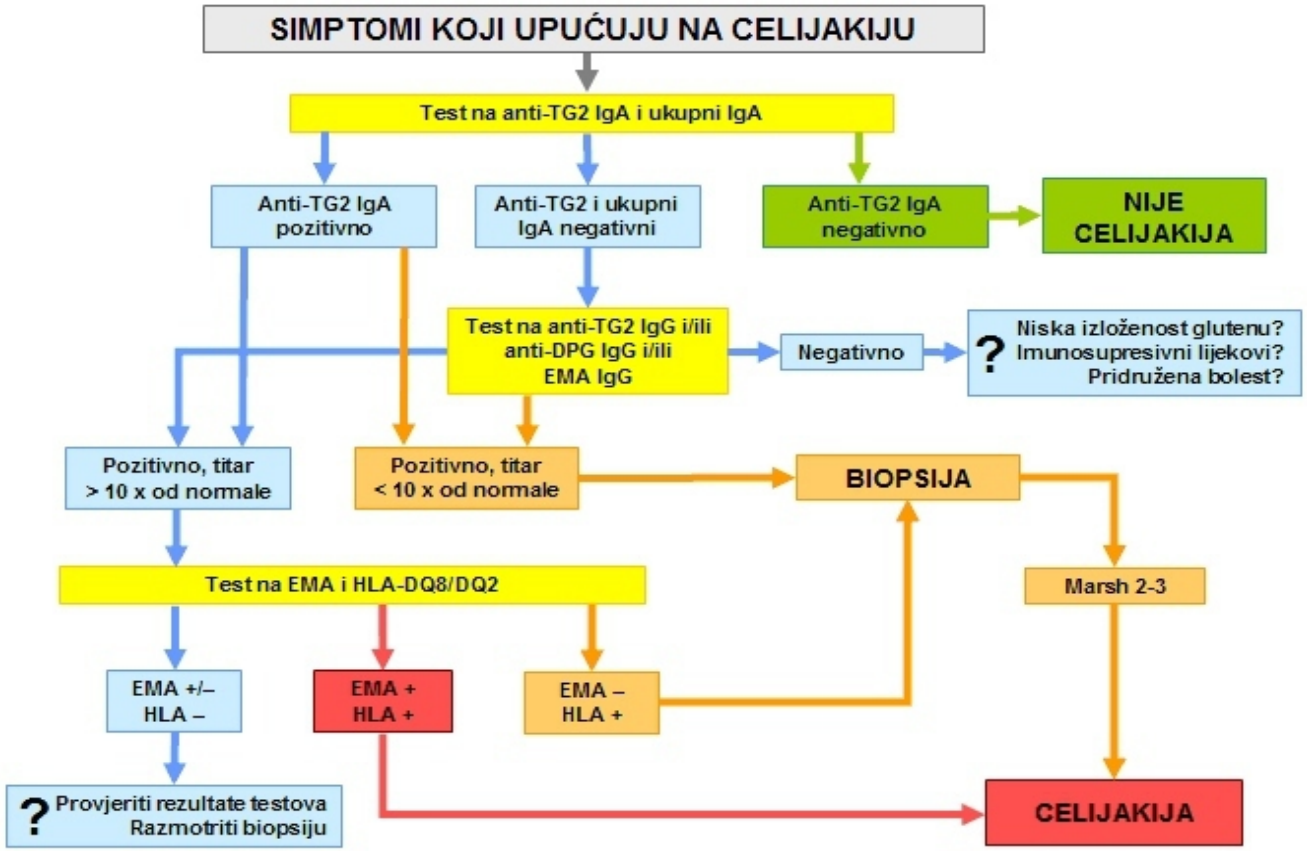

Celijakija je
jedna od
najčešćih
doživotnih
bolesti u svijetu...
pogađa 1% opće
populacije

Patološki spektar





Dijagnostički algoritam



Spektar preosjetljivosti na gluten

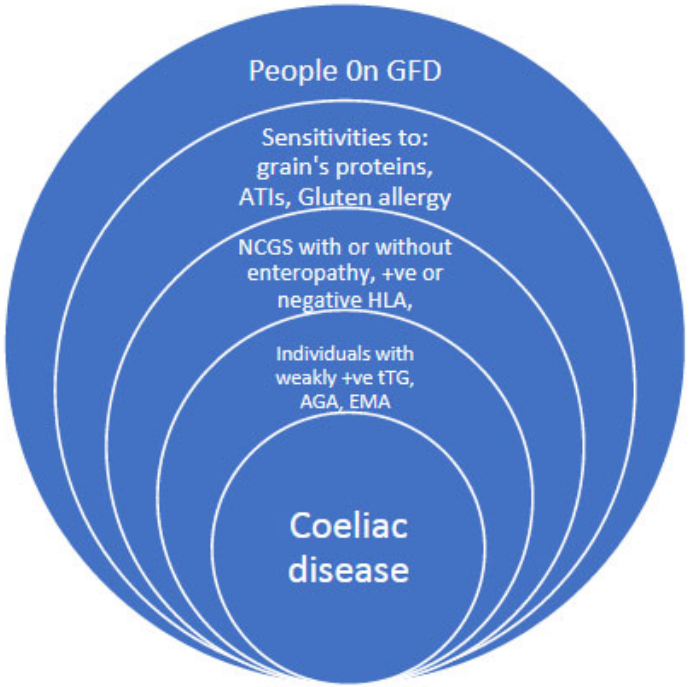
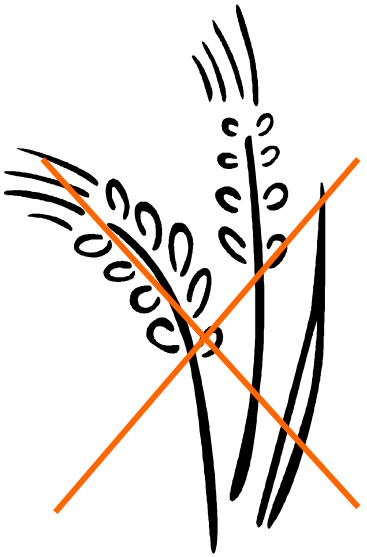


Figure 1. Gluten-related disorder, tTG: Tissue transglutaminase antibodies, AGA: Antigliadin antibodies, EMA: Endomysial antibodies, NCGS: Non-coeliac gluten sensitivity, ATIs: Amylase/trypsin inhibitors.

Celijakija - definicija

- **Celijakija**
  - imunološki posredovana sistemska bolest
  - izazvana glutenom i sličnim prolaminima
  - u genetski predisponiranih osoba (HLA DQ2 ili DQ8)
  - različite kliničke slike
  - pozitivna protutijela specifična za celijakiju
  - enteropatija

- **Protutijela:**
  - na tkivnu transglutaminazu tip2 (tTG)
  - endomizijska protutijela (EMA)
  - protutijela na deamidirani peptid glutena (DGP)



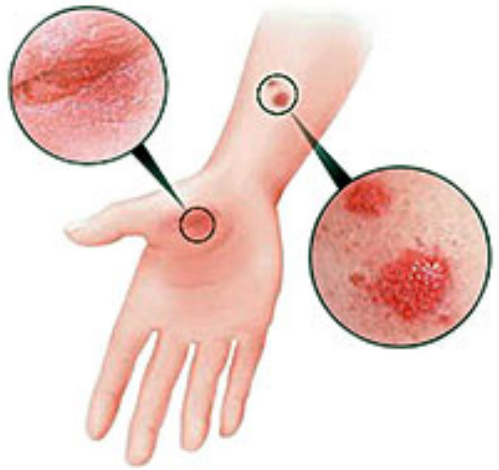
Klinička slika

Široka lepeza simptoma:

- a) Gastrointestinalni:
  - Kronični proljev
  - Kronična opstipacija
  - Bol u trbuhu
  - Mučnina
  - Povraćanje
  - Distendirani trbuh

Klinička slika

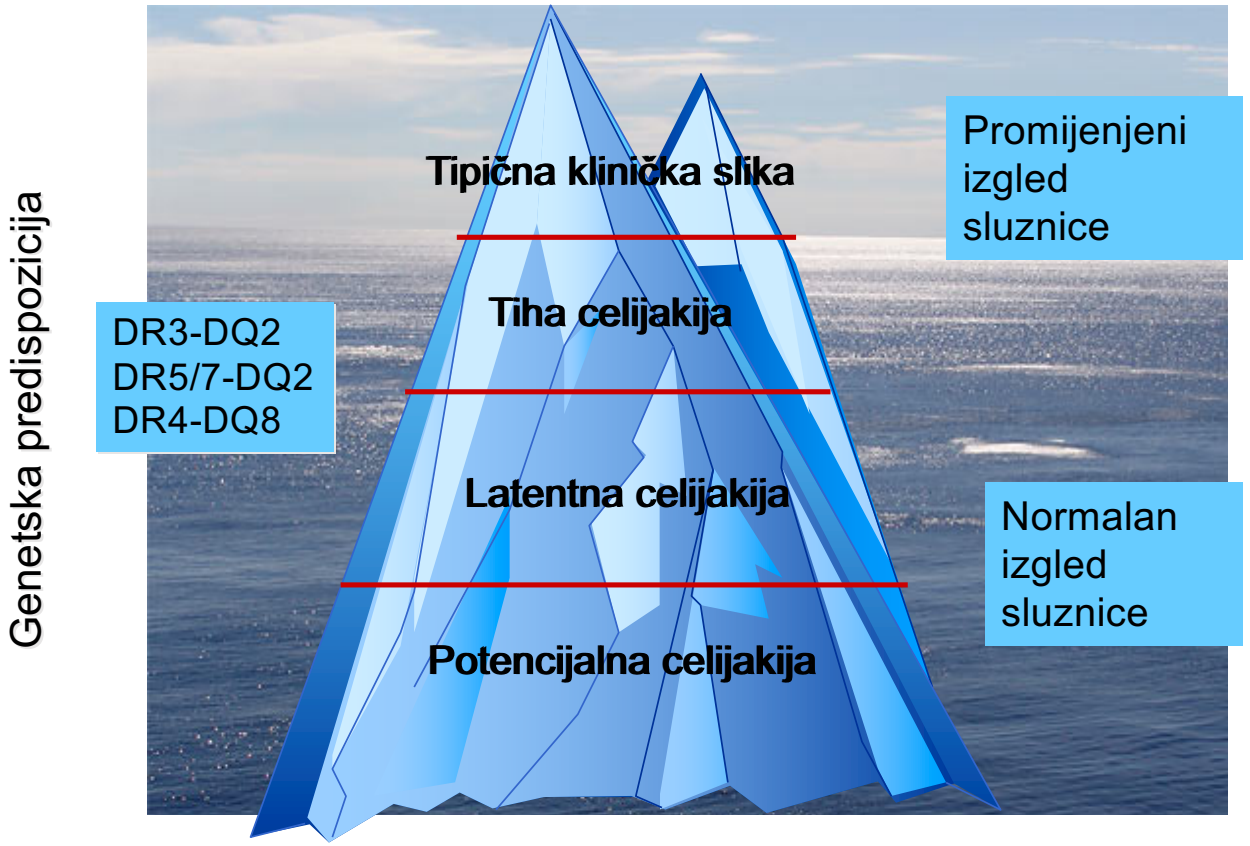
- b) Ekstraintestinalni:
  - Nenapredovanje
  - Zastoj u rastu
  - Odgođeni pubertet
  - Kronična anemija
  - Smanjena mineralizacija kosti
  - Defekti zubne cakline
  - Iritabilnost
  - Kronični umor
  - Neuropatija
  - Artritis/artralgija
  - Amenoreja
  - Povišeni jetreni enzimi
  - Rekurirajući aftozni stomatitis
  - Dermatitis herpetiformis



Celijakija - definicija

- *Tiha celijakija*
  - pozitivna protutijela za celijakiju
  - HLA heterodimer
  - nalaz biopsije tipičan za celijakiju
  - ali bez simptoma i znakova koji bi opravdali kliničku sumnju na celijakiju

Ledeni brijeg



Richard Logan, 1991

Nekada i sada

- U PROŠLOSTI (Κοιλιακός):

...rijetka enteropatija koju prati malapsorpcija, a javlja se u djece

- DANAS :

... često stanje koje se može dijagnosticirati u bilo kojoj dobi (predominantno bolest odraslih)

... može zahvatiti brojne organske sustave (kronična sistemska bolest – vrlo različiti simptomi)

… permanentno stanje – doživotna bolest

Koga testirati?

1. Testirati treba djecu i adolescente s određenim simptomima (koji se ne mogu objasniti drugim bolestima)

2. Testirati treba djecu i adolescente sa određenim bolestima koje se češće javljaju uz celijakiju

Koga testirati?

1. Testirati treba osobe sa sljedećim simptomima (koji se ne mogu objasniti drugim bolestima):

- Recidivirajuća bol u trbuhu, grčevi, distenzija
- Kronični ili ponavljajući proljev
- Nenapredovanje
- Sideropenična anemija
- Mučnina ili povraćanje
- Kronična opstipacija
- Gubitak TM i kronični umor
- Niski rast
- Odgođeni pubertet
- Amenoreja
- Rekurentni aftozni stomatitis
- Dermatitis herpetiformis
- Ponavljajući prijelomi / osteopenija / osteoporoza
- Poremećeni jetreni nalazi

Koga testirati?

2. Testirati treba pacijente sa sljedećim bolestima:

- DM tip1
- Down’s sy
- Autoimuna bolest štitnjače
- Turner sy
- Williams’ sy
- IgA deficijencija
- Autoimuna bolest jetre
- Srodnike oboljelih u prvom koljenu

Zakonitosti dobre dijagnostike

- Testirati **uvijek dok je osoba na prehrani koja sadrži gluten** (kako bi se izbjegli lažno negativni rezultati)

- Dojenčad – testirati tek nakon uvođenja dohrane koja sadrži gluten

- **Bezglutensku prehranu treba uvesti tek nakon dovršetka dijagnostičkog postupka** i nakon što je zaključeno da se radi o celijakiji - postavljena dijagnoza

Liječenje celijakije

Doživotna bezglutenska prehrana

- Ne sadrži **pšenicu, ječam i raž** te njihove derivate
- Ne sadrži sve "skrivene" izvore glutena

Dodatan unos energije, vitamina, minerala i energije

- Posebno važno na početku liječenja
- **Fe, Ca, D, folna kiselina, B12**

Nadomjestak tekućine i elektrolita

- Posebno tijekom razdoblja malapsorpcije i maldigestije

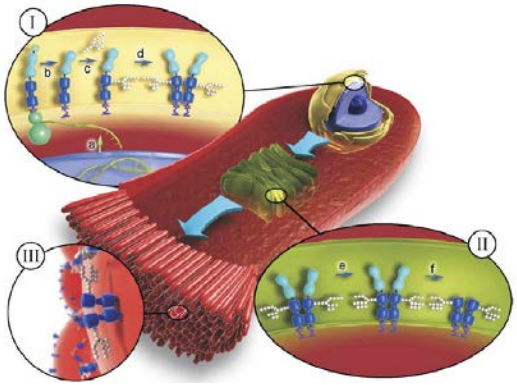
Nutritivni status novodijagnosticirane osobe

- ovisi o duljini trajanja aktivne, ali nedijagnosticirane bolesti, opsegu oštećenja gastrointestinalnog sustava te stupnju malapsorpcije.
- kod nekih pacijenata prisutan je značajan gubitak tjelesne mase, anemija te nedostatak vitamina i minerala.
- Česta je malapsorpcija željeza, folata i kalcija.
- Kako bolest napreduje, javlja se malapsorpcija ugljikohidrata, masti, vitamina topljivih u masti te ostalih mikronutrijenata.

Intolerancija laktoze (mliječnog šećera)

- posljedica bolesti koje oštećuju mukozno tkivo crijeva
  - reverzibilna i prolazna

- Smanjena aktivnost laktaze zbog oštećenja crijeva
- Preporučuje se privremeno provođenje bezglutenske dijete bez laktoze do oporavka sluznice crijeva



Anemija

- Ovisno o uzroku, prisutna anemija može se liječiti željezom, folatima ili vitaminom B_{12}, uz napomenu da se 78-94% odraslih oporavi od anemije i samim provođenjem bezglutenske dijete.

- Nadomjestak vitamina i minerala putem **bezglutenskih** dodataka prehrani!

Osobitosti početne nutritivne potpore

- Energetski unos treba biti oko 20 % viši od uobičajenog tijekom razdoblja kada se manifestira malapsorpcija.

- Dodatak folne kiseline, kalcija, vitamina D, A, E i K te omega-3 masnih kiselina

- Primjena PROBIOTIKA može biti korisna

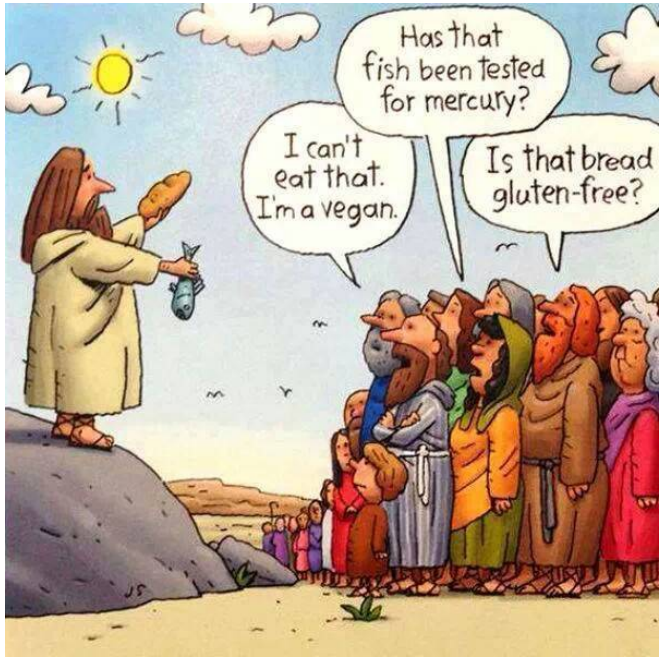
Gluten-free: trend ili potreba?

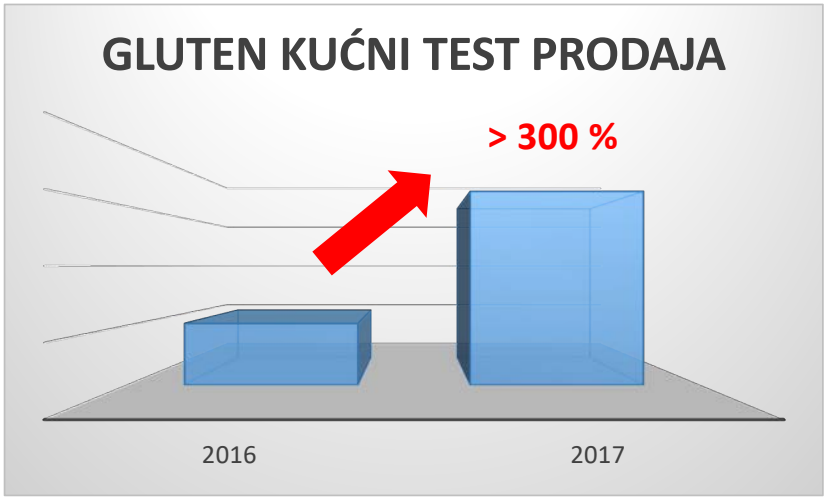
- Izniman porast popularnosti
- Slavni ambasadori i „gurui”
- Konzumacija glutena povezuje se s: debljinom, dijabetesom, „maglovitim” stanjem svijesti, nadutošću, autoimunim bolestima, autizmom....

Globalni rast gluten-free tržišta

- od 2010-2014 - godišnji rast od 30%
- 2016 – godišnji rast 12,6%

Izniman porast interesa za gluten





„Free-from” kategorija

YouTube

Pretraživanje

How to Become Gluten Intolerant (Funny) - Ultra Spiritual Life episode 12 - with JP Sears

9.367.316 pregleda

99 TIS. 4,2 TIS. PODIJELI

Dostupne bezglutenske namirnice

- bezglutenska brašna i proizvodi: kruh, tjestenina, keksi, mrvice, müsli, napolitanke, vafli, dvopek, cornflakes, korneti, kukuruzno brašno… proizvedeni od bezglutenskog brašna ili mješavina koje na sadrže gluten.

- Namijenjeni su isključivo oboljelima od celijakije za dnevnu prehranu i kao takvi spadaju u grupu specijalnih dijetetskih namirnica.

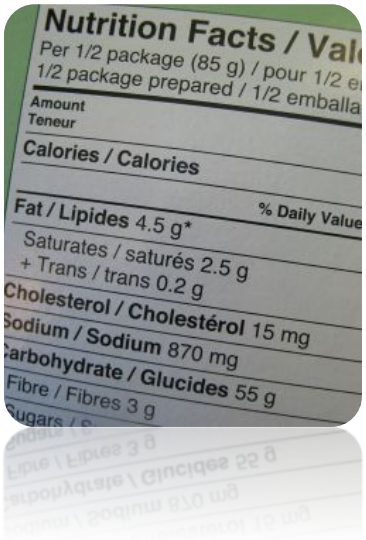
- Obilježene su internacionalnim znakom prekrižena klasa žita

Žitarice i namirnice bogate škrobom

Dopuštene	Rizične	Zabranjene
Kukuruz Riža Proso Heljda Amarant Brašno rogača Kvinoja Tapioka Manioka Krumpir Kesten	Čips od krumpira Instant palenta Cornflakes s raznim dodacima Heljdino brašno Kukuruzni škrob i brašno Rižin škrob i brašno Brašno od slanutka Krumpirov škrob Brašno od prosa Tapioka brašno Manioka brašno Brašno od prosa *Brašno može biti kontaminirano ako se melje na istom mlinu, kao i žitarice koje sadrže gluten.*	Pšenica i njezini derivati Ječam i njegovi derivati Raž i njezini derivati Pir i njegovi derivati Pšenoraž Emmer, kamut Bulgur, couscous, mekinje gore navedenih žitarica Ječmeni slad Musli i žitarice za doručak napravljene od gore navedenih žitarica Tjestenina (svježa, suha, sa ili bez punjenja) Zob i njegovi derivati Slatki ili slani pečeni proizvodi (kruh, štapići, kolači, krekeri, pizza, keksi...)

Rizične i zabranjene namirnice iz ostalih skupina

- Kandirano i suho voće tretirano brašnom
- Panirano i procesirano povrće
- Gotova jela
- Pudinzi, kreme, umaci
- Jogurti sa žitaricama
- Panirana riba i meso
- Pivo, kavovine, viski
- Gotovi slatkiši, kolači, čokoladne praline...



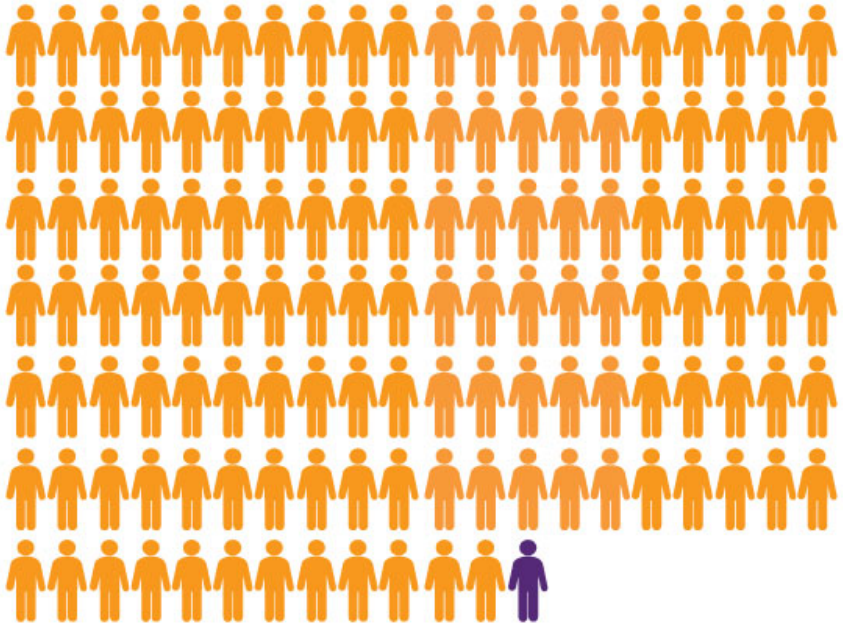
Hrana koja ne sadrži gluten

- Svježe i adekvatno konzervirano meso, perad, riba i plodovi mora
- Svježe i adekvatno konzervirano voće i povrće
- Jaja
- Sir i drugi mliječni proizvodi
- Svi proizvodi napravljeni sa sastojcima bez glutena
- Proizvodi s oznakom prekriženog klasa

Bez glutena – trend ili stvarna potreba?

1. **Raste li učestalost celijakije i preosjetljivosti na gluten i zašto?**
2. Koje komorbitete možemo očekivati ako se celijakija dijagnosticira u odrasloj dobi?
3. Postoji li doista intolerancija na gluten nevezana za celijakiju?
4. Je li moguće provoditi dijetu 100% bez glutena?
5. Ima li smisla bezglutenska prehrana u drugim indikacijama?

Celijakija, NCGS i alergija na pšenicu



- Vrlo mali broj osoba (<1%) ima celijakiju
- Mali broj ljudi (0.5-6%) ima NCGS
- Vrlo mali broj ljudi (<.5%) ima alergiju na pšenicu

Chafen JJ, Newberry SJ, Riedl MA, et al. Diagnosing and managing common food allergies: a systematic review. JAMA. 2010 May 12;303(18):1848-56.

Raste li učestalost celijakije?

- Širom svijeta raste učestalost celijakije
- Razlozi povećanja nedovoljno rasvijetljeni
- Sve autoimune bolesti su u porastu

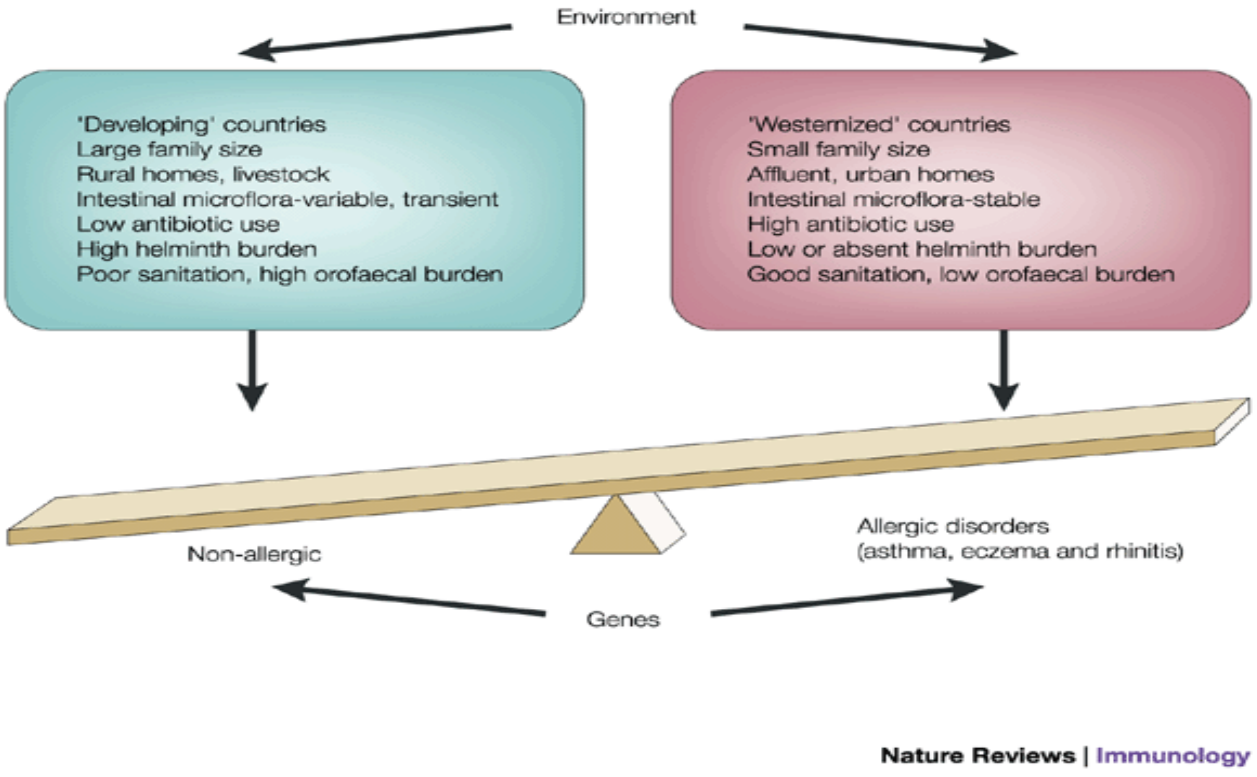
- *Porast NIJE izazvan:*
  - Povećanim udjelom glutena u pšenici
  - GMO modifikacijama

Source: Kasarda, D. Can an Increase in Celiac Disease Be Attribute to an Increase in the Gluten Content of Wheat as a Consequence of Wheat Breeding? J Agric Food Chem 2013; 61, 115t-59.

Potencijalni razlozi veće učestalosti celijakije

- Hipoteza **higijene**
- Nekvalitetna prehrana, nizak unos vlakana
- Bakterijsko prerastanje
- Dodatak glutena u brojne prehrambene proizvode
- Bolja svjesnost i kvalitetnija dijagnostika
- **Kraće vrijeme fermentacije** za komercijalne vrste kruha
- Veći broj poroda carskim rezom
- Uvođenje glutena u dohranu dojenčadi koja nije dojena
- Promjene u **mikrobiomu crijeva**

Teorija higijene



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Adultna celijakija

- Često neprepoznata / „tiha" celijakija
- Atipična simptomatologija
- Veća učestalost refraktorne celijakije
- Komorbiditeti: anemija, neplodnost, neurološki i psihijatrijski sindromi, kožne manifestacije, frakture kosti, autoimune bolesti uključujući dijabetes tip 1, bolesti štitnjače / jetre, intoleranciju laktoze
- Debljina, NAFLD!
- Promjene mikrobiote
- QoL

AP&T Alimentary Pharmacology and Therapeutics

Metabolic syndrome in patients with coeliac disease on a gluten-free diet

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SUMMARY

Background
Several studies have shown that weight changes are common in patients with coeliac disease after starting a gluten-free diet (GFD), but data on the prevalence of metabolic syndrome in this population are still scarce.

Aims
To assess the prevalence of metabolic syndrome in patients with CD at diagnosis and 1 year after starting GFD.

Methods
We enrolled all consecutive patients with newly diagnosed coeliac disease (CD) who were referred to our third-level CD Unit. For all patients we collected: waist circumference, BMI, blood pressure, lipid profile (HDL cholesterol, triglycerides) and levels of blood glucose. Diagnosis of metabolic syndrome was made according to the International Diabetes Federation (IDF) criteria for European countries. The prevalence of metabolic syndrome was re-assessed after 12 months of GFD.

Results
Ninety-eight patients with CD were assessed, two patients with CD (2%) fulfilled the diagnostic criteria for metabolic syndrome at diagnosis and 29 patients (29.5%) after 12 months of GFD ($P < 0.01$; OR: 20). With regard to metabolic syndrome sub-categories 1 year after GFD compared to baseline respectively: 72 vs. 48 patients exceeded waist circumference cut-off ($P < 0.01$; OR: 2.8); 18 vs. 4 patients had high blood pressure ($P < 0.01$; OR: 5.2); 25 vs. 7 patients exceeded glycemic threshold ($P = 0.01$; OR: 4.4); 34 vs. 32 patients with CD had reduced levels of HDL cholesterol ($P = 0.7$); and 16 vs. 7 patients had high levels of triglycerides ($P = 0.05$).

Conclusions
Patients with coeliac disease show a high risk of metabolic syndrome 1 year after starting a gluten-free diet. We suggest that an in-depth nutritional assessment is undertaken for all patients with coeliac disease.

doi:10.1111/apt.13062

Review

SCI

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(wileyonlinelibrary.com) DOI 10.1002/jsfa.7101

Nutritional aspects of gluten-free products

Nicoletta Pellegrini[a*] and Carlo Agostoni[b,c]

Abstract

In recent years, gluten-free (GF) goods have become popular, fuelling a growing market, as they not only cater to individuals with medical needs but also to consumers who seek a GF diet. In their development, it is pivotal to pay attention to nutritional quality. This review aims to provide some insights on the nutritional quality of GF products, focusing on major concerns and the strategies to overcome them. In order to mimic the viscoelastic properties of gluten, a large number of flours and starches and other ingredients have been used. Therefore the different mixtures of these ingredients bring a wide difference in the nutritional composition of GF foods with respect to gluten-containing counterparts. Several GF foodstuffs contain more fat, including saturated, and salt but fewer minerals and vitamins than their equivalents with gluten. The increased fibre content and improved technological processes have positively affected the glycaemic responses from these goods. However, in order to improve their nutritional quality, wholemeal GF cereals and pseudocereals with high nutritive value should replace the low-nutritional GF flours and consequently the technological processes would be optimized. The improvement of the nutritional quality of GF products, and in turn that of the GF diet, should also be aimed at lowering the risk of later chronic degenerative disorders, especially for infants and young children.

Keywords: gluten-free foods; nutritional quality; wholemeal cereals; children

Bez glutena – trend ili stvarna potreba?

1. Raste li učestalost celijakije i preosjetljivosti na gluten i zašto?
2. Koje komorbitete možemo očekivati ako se celijakija dijagnosticira u odrasloj dobi?
3. **Postoji li doista intolerancija na gluten nevezana za celijakiju?**
4. Je li moguće provoditi dijetu 100% bez glutena?
5. Ima li smisla bezglutenska prehrana u drugim indikacijama?

Spektar intolerancije glutena nevezan za celijakiju (NCGS)

Box 1 | Characteristic phenotypes of self-reported NCGS*

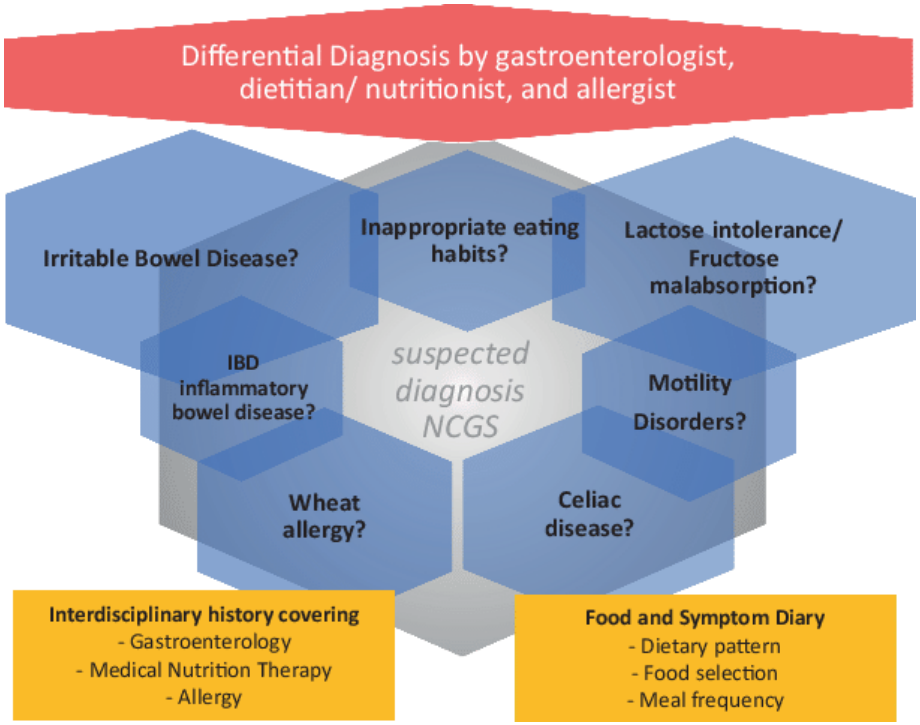
Female prevalence: 72–84%
Mean age: 38 years

Lower gastrointestinal symptoms
- Diarrhoea: 16–54%
- Constipation: 18–24%
- Altered bowel habit: 27%
- Abdominal pain/discomfort: 67–83%
- Bloating: 72–87%
- Weight loss: 25%

Upper gastrointestinal symptoms
- Epigastric pain: 52%
- Nausea: 9–44%
- Aerophagia: 36%
- Gastro-oesophageal reflux: 32%
- Aphthous stomatitis: 31%

Extraintestinal symptoms
- Skin rash (eczema or dermatitis): 6–40%
- Brain: depression 15–22%; foggy mind 34–42%; anxiety 39%; confusion 5%; headaches 22–54%
- Limb numbness: 6–32%
- Joint or muscle pains (fibromyalgia-like symptoms): 8–31%
- Fatigue: 23–64%
- Lack of well-being: 68%

Data taken from several reports.[16,35,39,40] *In adults. Abbreviation: NCGS, noncoeliac gluten sensitivity.



Aziz, I. *et al. Nat. Rev. Gastroenterol. Hepatol.* 12, 516–526 (2015)

Gluten & ostali krivci za NCGS i IBS

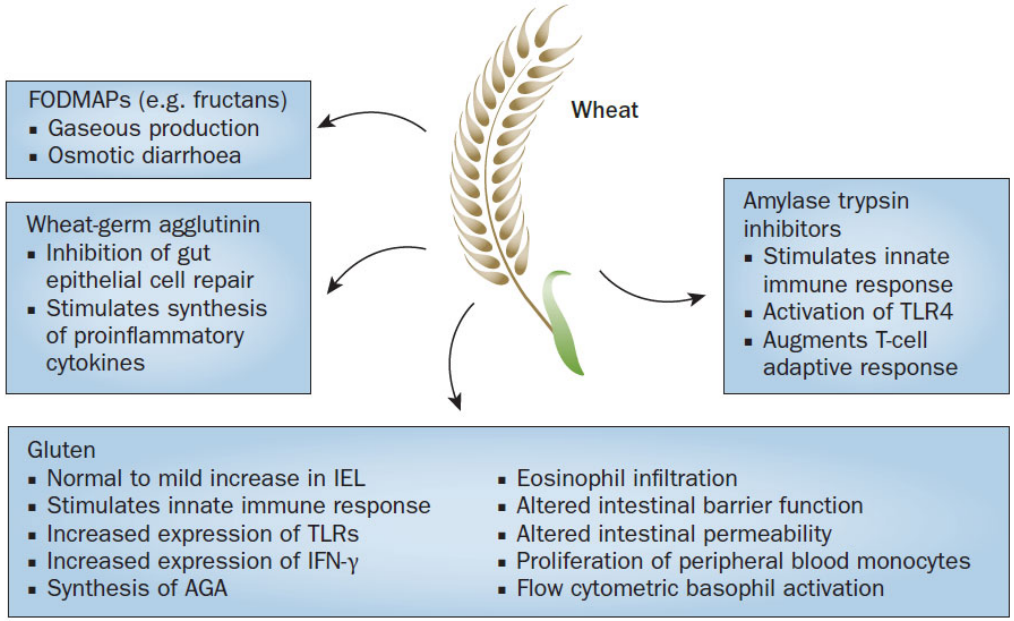


Figure 3 | Proposed effects of wheat-based constituents that trigger clinical symptoms in NCGS. Gluten, FODMAPs, amylase trypsin inhibitors and wheat-germ agglutinin have been identified as causing symptoms in patients with NCGS. Some of the effects attributed to gluten might be caused by nongluten components. Abbreviations: AGA, antigliadin antibody; FODMAP, fermentable oligosaccharide, disaccharide, monosaccharide and polyol; IEL, intraepithelial lymphocyte; NCGS, noncoeliac gluten sensitivity; TLR, Toll-like receptor.

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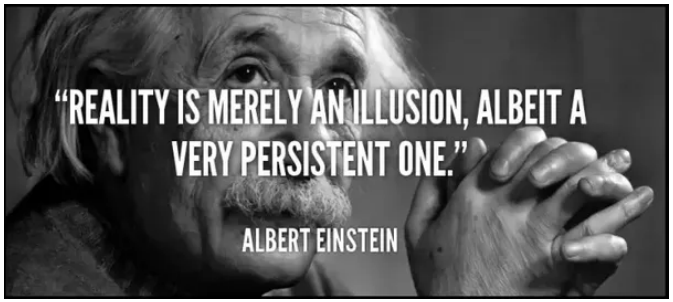
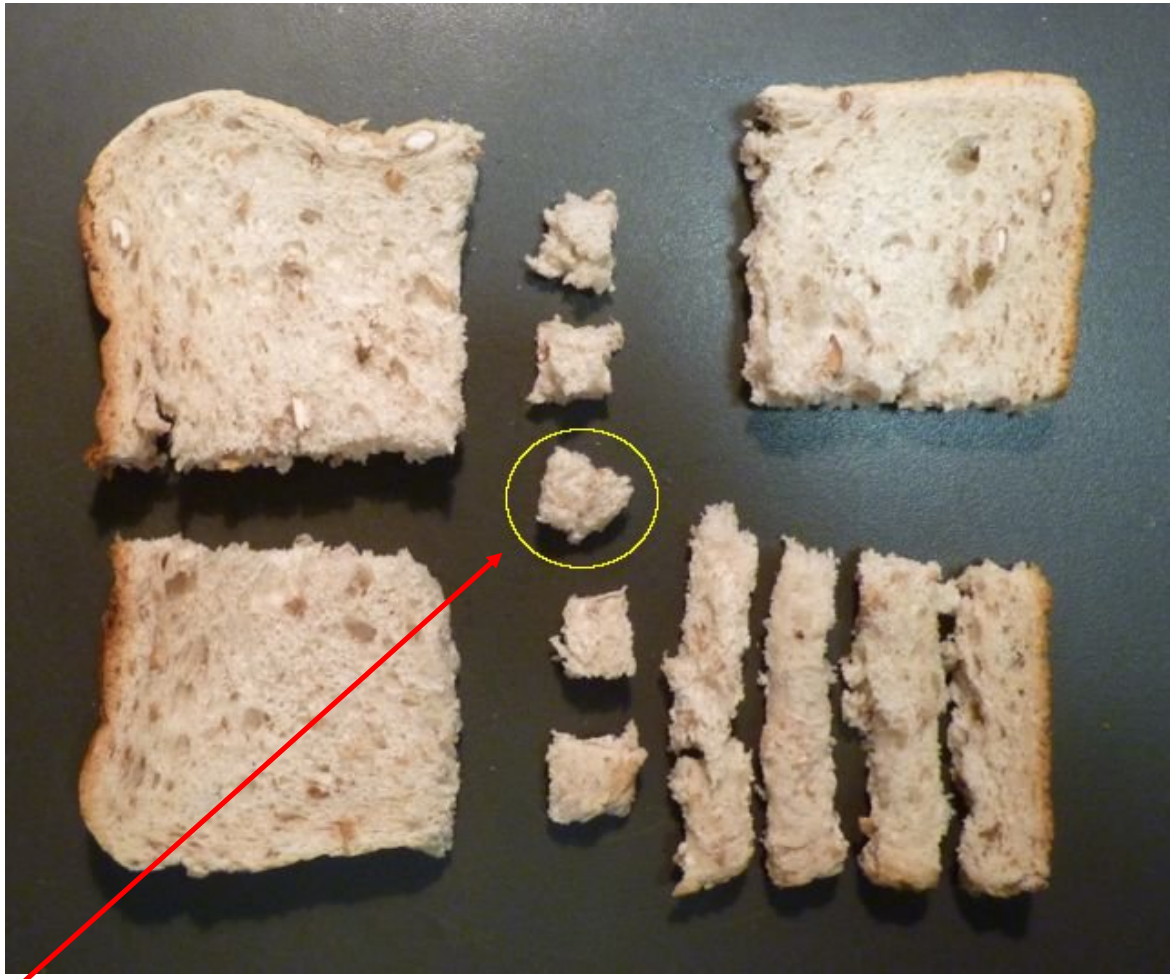
„Gluten free”

- Implicira potpunu eliminaciju svih izvora glutena
- U stvarnosti to nije moguće zbog kontaminacije hrane s tragovima glutena
- *Magična granica*: < 20 mg/dan





50 mg glutena = 1/100 prosječne kriške kruha


DAN 1
GLUTEN FREE


DAN 2
GLUTEN FREE

Determination of gluten consumption in celiac disease patients on a gluten-free diet

Jack A Syage,[1] Ciarán P Kelly,[2] Matthew A Dickason,[1] Angel Cebolla Ramirez,[3] Francisco Leon,[3] Remedios Dominguez,[3] and Jennifer A Sealey-Voyksner[1]

[1]ImmunogenX, Newport Beach, CA; [2]Beth Israel Deaconess Medical Center, Harvard Medical School, Boston MA; and [3]Biomedal, Seville, Spain

TABLE 1
Gluten consumption as measured in stool[1]

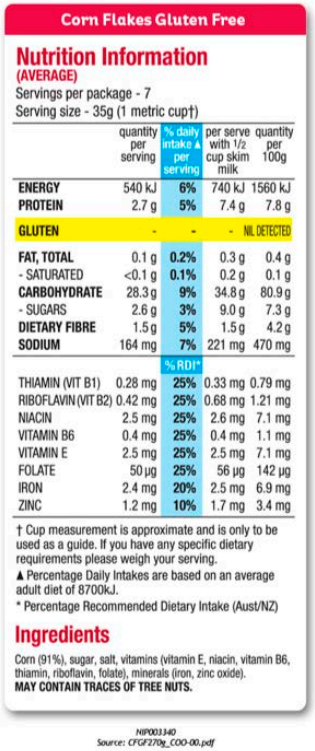
		GIP concentration (μg/g stool)			Gluten daily consumption (mg)		
Cohort	*n*	Mean	Median	SD	Mean	Median	SD
Healthy non-CD							
Adults	73	5.23	7.60	2.95	7802	11,699	4757
CD on GFD							
Adults (≥13 y)	74	0.22	0.13	0.40	244	141	488
Children (4–12 y)	79	0.32	0.11	0.88	387	118	1216
Children (0–3 y)	35	0.14	0.10	0.19	155	104	214

[1]Conversion factor for y = GIP (μg/g stool) to x = gluten daily consumption (mg) is $y = 0.0649x^2 + 1.0461x$. CD, celiac disease; GFD, gluten-free diet; GIP, gluten immunogenic peptide.

Am J Clin Nutr 2018;107:201–207.

Adherencija

- Motivacija
- Nedostatak edukacije
- Ukupna konzumacija gluten-free hrane
- Kontaminacija
- Cijena
- Označavanje hrane – industrijski proizvodi i restorani
- Regulativa i propisi
- Anksioznost



Corn Flakes Gluten Free

Nutrition Information
(AVERAGE)
Servings per package - 7
Serving size - 35g (1 metric cup†)

	quantity per serving	% daily intake ▲ per serving	per serve with 1/2 cup skim milk	quantity per 100g
ENERGY	540 kJ	6%	740 kJ	1560 kJ
PROTEIN	2.7 g	5%	7.4 g	7.8 g
GLUTEN	-	-	-	NIL DETECTED
FAT, TOTAL	0.1 g	0.2%	0.3 g	0.4 g
- SATURATED	<0.1 g	0.1%	0.2 g	0.1 g
CARBOHYDRATE	28.3 g	9%	34.8 g	80.9 g
- SUGARS	2.6 g	3%	9.0 g	7.3 g
DIETARY FIBRE	1.5 g	5%	1.5 g	4.2 g
SODIUM	164 mg	7%	221 mg	470 mg
		%RDI*		
THIAMIN (VIT B1)	0.28 mg	25%	0.33 mg	0.79 mg
RIBOFLAVIN (VIT B2)	0.42 mg	25%	0.68 mg	1.21 mg
NIACIN	2.5 mg	25%	2.6 mg	7.1 mg
VITAMIN B6	0.4 mg	25%	0.4 mg	1.1 mg
VITAMIN E	2.5 mg	25%	2.5 mg	7.1 mg
FOLATE	50 µg	25%	56 µg	142 µg
IRON	2.4 mg	20%	2.5 mg	6.9 mg
ZINC	1.2 mg	10%	1.7 mg	3.4 mg

† Cup measurement is approximate and is only to be used as a guide. If you have any specific dietary requirements please weigh your serving.
▲ Percentage Daily Intakes are based on an average adult diet of 8700kJ.
* Percentage Recommended Dietary Intake (Aust/NZ)

Ingredients
Corn (91%), sugar, salt, vitamins (vitamin E, niacin, vitamin B6, thiamin, riboflavin, folate), minerals (iron, zinc oxide).
MAY CONTAIN TRACES OF TREE NUTS.

NIP003340
Source: CFGF270g_COO-00.pdf

PRIMJERI I PRIDRŽAVANJE BEZGLUTENSKE PREHRANE

Gluten-Free Flours

Flour	*Color*	*Flavor*
Almond	Ivory	Sweet and mild
Amaranth	Pale yellow	Mild
Buckwheat	Medium brown	Strong
Chestnut		
Chickpea		
Corn		
Fava bean		
Millet	Pale yellow	Mild
Quinoa	Beige	Medium
Rice flour (white or brown)	Beige	Mild
Sorghum (milo)	Beige	Mild
Soy	Pale yellow	Like bean sprouts
Tapioca	White	Very mild
Teff	Medium brown	Earthy

Source: Adapted from The Artisan Bread Machine, *by Judith Fertig (Robert Rose).*

✓*BEZ GLUTENA I PREKRIŽENI KLAS - NE ZNAČE DA GLUTENA NEMA!*

Whole grain wheat is listed under Ingredients →

Allergy Statement →

INGREDIENTS: WHOLE GRAIN WHEAT, CINNAMON, MOLASSES, SUGAR, SALT, TRISODIUM PHOSPHATE, BHT ADDED TO PRESERVE FRESHNESS.

VITAMINS AND MINERALS: VITAMIN C (SODIUM ASCORBATE),CALCIUM CARBONATE, IRON AND ZINC (MINERAL NUTRIENTS), A B VITAMIN (NIACINAMIDE), VITAMIN B_6 (PYRIDOXINE HYDROCHLORIDE), VITAMIN D3, VITAMIN B_2 (RIBOFLAVIN), A B VITAMIN (FOLIC ACID), VITAMIN B, THIAMIN MONONITRATE), VITAMIN A (PALMITATE), VITAMIN B_{12}

CONTAINS WHEAT INGREDIENTS

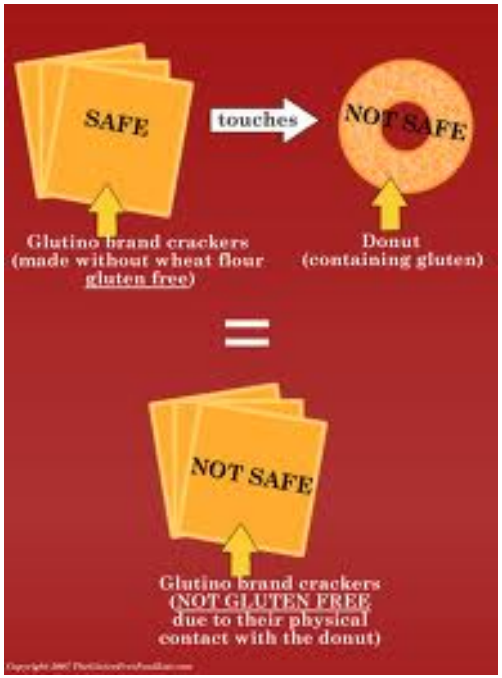
Fagopyrum esculentum

Amaranthus cruentus

Chenopodium quinoa

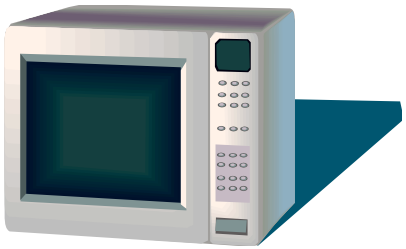
UZGOJ SIROVINA

SKLADIŠTENJE SIROVINA, PROIZVODNJA i SKLADIŠTENJE GOTOVIH PROIZVODA



KAKO IZBJEĆI KONTAMINACIJU/ONEČIŠĆENJE GLUTENOM U KUHINJI?

- ✓RADNE POVRŠINE MORAJU BITI ČISTE
- ✓KORISTITI ODVOJENI KUHINJSKI PRIBOR
- ✓KORISTITI POSEBNE RADNE POVRŠINE, ako je moguće ILI IH BAREM DEZINFICIRATI ALKOHOLOM
- ✓KORISTITI ODVOJENE MIKROVALNE UREĐAJE, FRITEZE, ROŠTILJE, TOSTERE
- ✓UPOTREBLJAVATI ČISTU VODU ZA KUHANJE, NE ODSTAJALU



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Celijakija je znatno učestalija u određenim dijagnozama

Dijabetes tip 1	3.5 - 10%
Tireoiditis*	4 - 6%
Autoimuni hepatitis	6-15%
Addisonova bolest	6%
Artritis	1.5 - 7.5%
Autoimune bolesti jetre	6 - 8%
Sjögrenov sindrom	2 - 15%
Idiopatska dilatacijska kardiomiopatija	5.7%
IgA nefropatija	3.6%

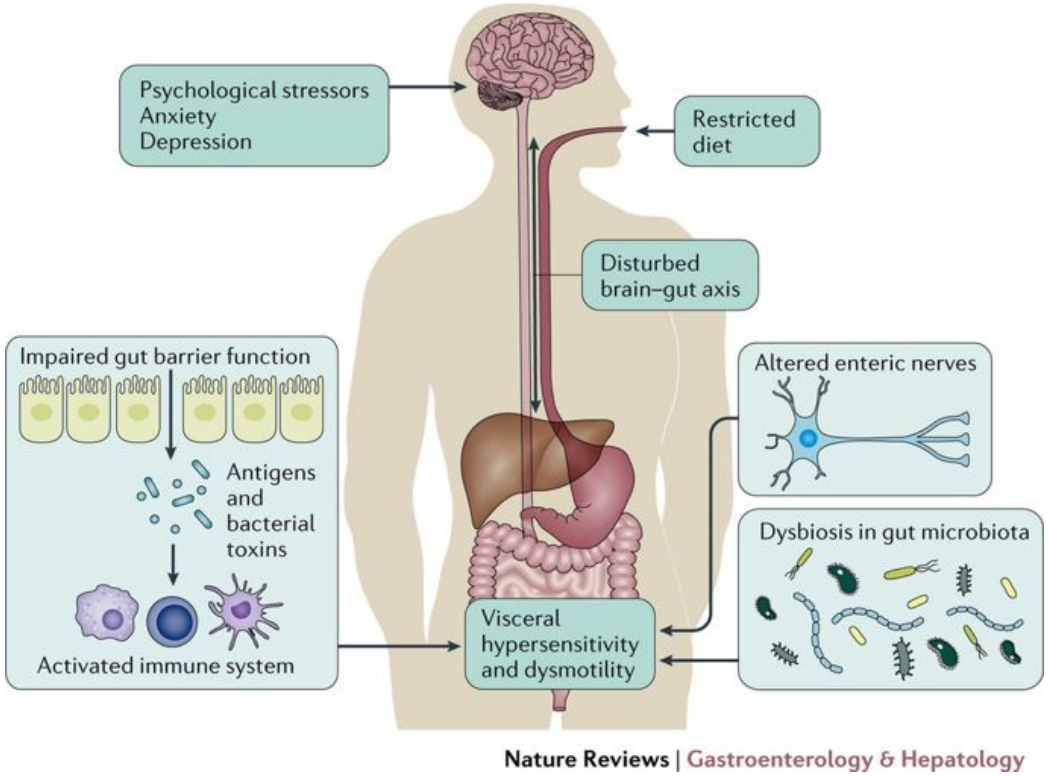
(*) 15% bolesnika s CD ima tireoiditis, a 40% ima povišena antitijela

Tko sve primjenjuje bezglutensku prehranu?

- Oboljeli od celijakije
- Osobe s intolerancijom glutena
- Osobe s alergijom na pšenicu
- Djeca s autizmom ili nedefiniranim smetnjama u razvoju
- Oboljeli od GvHD-a
- Bolesnici koji primaju terapiju zračenjem na abdomen
- Osobe s oštećenjima probavnog sustava
- Osobe s drugim autoimunim bolestima?

Dijagnoze u kojima se učestalo iskušava GF dijeta

- IBS
- IBD
- Autoimune bolesti
  - Hashimotov tireoiditis
  - Dijabetes tip 1
  - Kolagenoze
  - Reumatoidni artritis
  - …



Gluten i autoimune bolesti

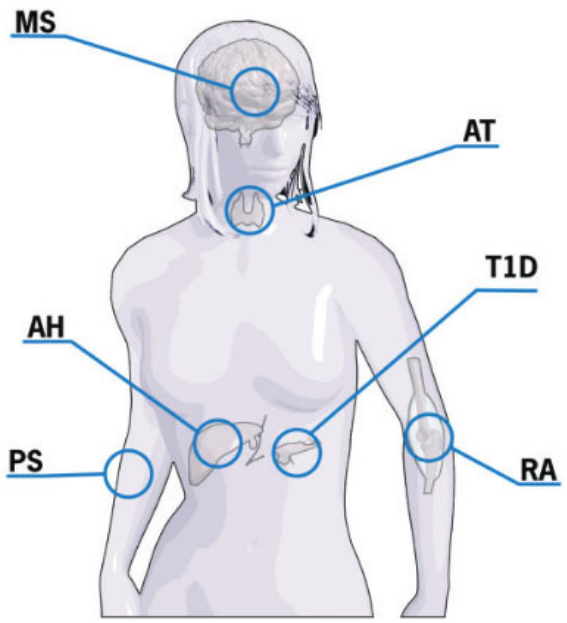


Figure 1 **Autoimmune diseases that improve following gluten withdrawal**. *Abbreviations*: AT, autoimmune thyroiditis; AH, autoimmune hepatitis; MS, multiple sclerosis; PS, psoriasis; RA, rheumatoid arthritis; T1D, type 1 diabetes.

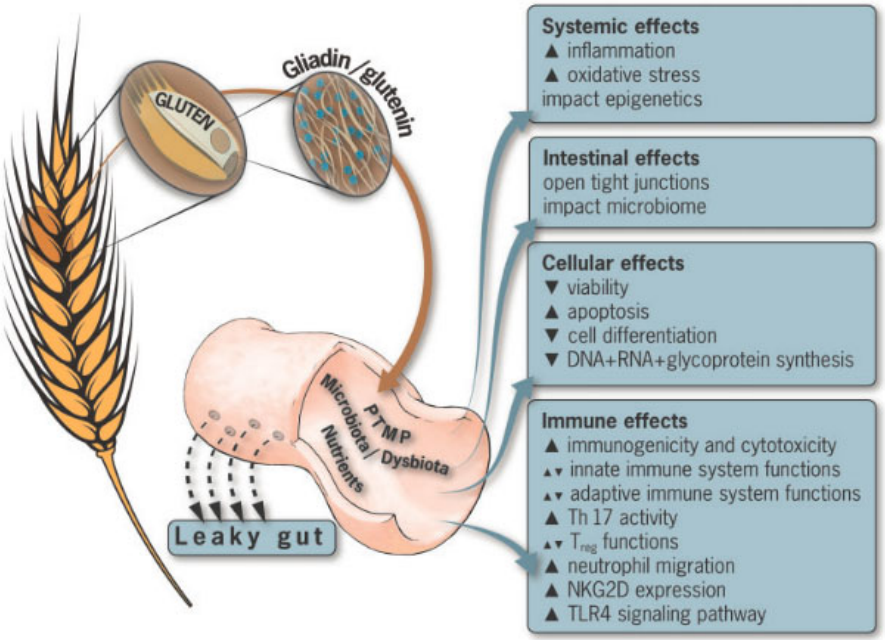


Figure 2 **Adverse effects of gluten on the human cellular, immune, intestinal, and systemic compartments**. *Abbreviations and symbols*: NKG2D, natural killer group 2D costimulatory molecule; PTMP, post-translational modification of proteins; T_H-17, T-helper 17 lymphocytes; TLR4, Toll-like receptor 4 signaling pathway; T_{reg}, regulatory T cells; ▲, increased; ▼, decreased.

Nutrition Reviews 2017. Vol. 75(12):1046–1058

The Effect of Gluten-Free Diet on Thyroid Autoimmunity in Drug-Naïve Women with Hashimoto's Thyroiditis: A Pilot Study.

Krysiak R, et al. *Exp Clin Endocrinol Diabetes. 2018.*

- **Polazište:** autoimuna bolest štitnjače može biti udružena s celijakijom
- **Cilj istraživanja:** istražiti utječe li bezglutenska prehrana na autoimunost štitnjače, aktivnost osi hipotalamus -hipofiza – štitnjača i parametre funkcije štitnjače u žena s Hashimotovim tireoiditisom
- **Metode:** 34 žene podijeljene u dvije skupine. Skupina A: bezglutenska dijeta kroz 6 mjeseci; Skupina B: bez prehrambene intervencije. Mjereni parametri: serumski titar tiroidne peroksidaze, tiroglobulinska antitijela, serumske razine tirotropina, slobodni hormoni štitnjače, 25 –OH vitamin D.
- **Rezultati:** U skupini B svi parametri bili su nepromijenjeni nakon 6 mjeseci. U grupi A: GF dijeta dovela je do sniženja titra tiroidnih antitijela i blagog povećanja 25-OH vitamina D te indeksa sekretornog kapaciteta štitnjače.

- **Zaključak:** Bezglutenska dijeta može imati pozitivne kliničke učinke na žene s autoimunom bolesti štitnjače.

Trend ili stvarna potreba?

UMJESTO ZAKLJUČKA - PODSJETNIK

- ✓“SIGURNE” žitarice: kukuruz, riža, heljda, sirak, amaranth, kvinoja, proso
- ✓OSTALE „SIGURNE” NAMIRNICE: svo voće i povrće, mahunarke, riba, jaja, plodovi mora, prirodni mliječni proizvodi, orašasti plodovi, krumpir
- ✓PRIPREMA HRANE je najosjetljiviji dio
- ✓**PAZITI NA kontaminaciju glutenom!**