4. HRVATSKI KONGRES MENOPAUZALNE MEDICINE

s međunarodnim sudjelovanjem

6. – 7. 10. 2022.
Hotel Westin / Zagreb

Prehrana tijekom menopauze – novije spoznaje

izv. prof. dr. sc. Donatella Verbanac

Zavod za medicinsku biokemiju i hematologiju
Sveučilište u Zagrebu
Farmaceutsko biokemijski fakultet

Zagreb, 6. listopada 2022.

Food Forensic

HAMAG BICRO

HRZZ Croatian Science Foundation

CRC MolProfil

Osnovni principi pravilne prehrane

- Važno je da tijelo obrokom dobije različite namirnice:
  - Pet skupina osnovnih prehrambenih tvari: proteini ili bjelančevine, ugljikohidrati ili šećeri, lipidi ili masti, minerali i vitamini, te šesti „element” – voda.

- Obrokom treba unijeti točno određenu količinu prehrambene tvari koja odgovara našoj dobi, građi i potrebama.

Dvije vrste pojedinaca

BMI ≤ 20

- Povećavati unos kalorija (250-350 Kcal dnevno)
- Prehrana s više složenih ugljikohidrata i s većim udjelom mononezasićenih i polinezasićenih masnih kiselina
- Poželjno je uvećanje mase od 1,5 kg mjesečno

BMI ≥ 30

- Smanjivati unos kalorija (300-500 Kcal dnevno)
- Prehrana s manje ugljikohidrata i masti
- Poželjan je gubitak 5-10% tjelesne mase u 12 mjeseci

B. Sears and C. Ricordi, J Obes., 2011

Od čega se sastoji naše tijelo

70 kg

- 42 kg voda = 60%
- 11 kg bjelančevina = 17%
- 10 kg masti = 15%
- 5 kg minerali i vitamini = 7%
- 0,5 kg glikogen = 1%

100 kg

- 40 kg voda = 40%
- 10 kg bjelančevina = 10%
- 42 kg masti = 42%
- 5 kg minerali i vitamini = 5%
- 0,5 kg glikogen = 0,5%

I onda nailazimo na ovakve poruke…

Poželjna prehrana za određenu masu tijela

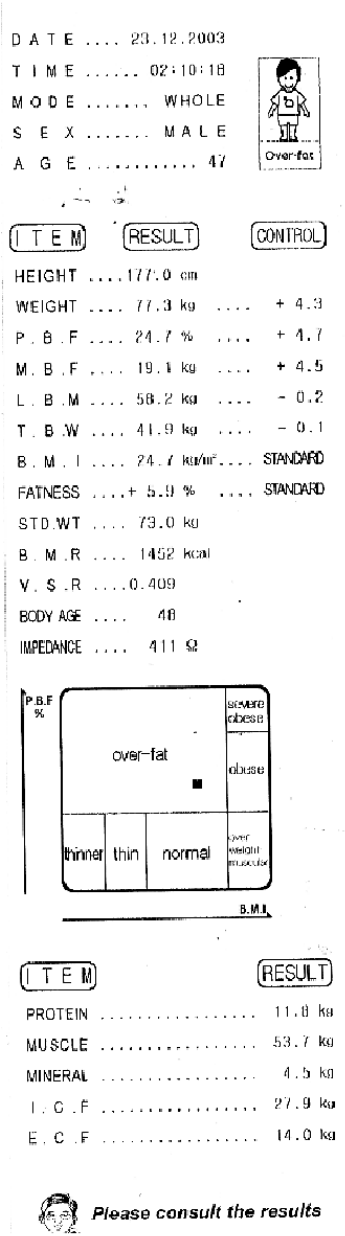
- O prekomjernoj tjelesnoj težini i o zdravstvenim problemima vezanima za njezinu pojavu sve se više vodi briga u znanstvenim i laičkim krugovima.
- Danas se pretilost klasificira kao bolest.
- Edukacija svih dobnih skupina ključna je u razumijevanju i primjeni pojedinih pravila koja govore o tome kako svatko od nas može preventivno djelovati i sačuvati zdravlje organizma vodeći brigu o unesenim i potrošenim kalorijama tijekom dana.

- Pri utvrđivanju pretilosti i pri provođenju dijeta za mršavljenje treba pratiti opseg struka, a manji naglasak dati na apsolutni gubitak kilograma.
- Svako smanjenje opsega struka vodi prema boljoj fizičkoj kondiciji, smanjuje opasnost od bolesti prouzročenih postojanjem masnog tkiva na području oko struka jer upravo se za to masno tkivo zna da djeluje na izlučivanje molekula koje pokreću upalne i degenerativne procese u organizmu.

Što se određuje mjerenjem impedancije?

- Količina vode u tijelu
- Masa tijela bez masti
- Postotak masti

Korisni podaci za liječnika i pojedinca koji dolazi provjeriti svoj zdravstveni status



Slaganje obroka za žene u menopauzi

•**Individualni princip** –u slaganju obroka posebna se pozornost pridaje proteinima, koji su uz vodu temelj izgradnje svih naših fiziološki važnih enzima, osnovnih građevnih struktura i mišića.

Prednost bjelančevina iz životinjskih izvora

- Cjelokupan izvor bjelančevina (sadrže sve aminokiseline)
- Kvalitetnije se ugrađuju u mišiće, dulje zadržavanju dušik i posjeduju bolju anti-kataboličku aktivnost u odnosu na biljne izvore bjelančevina
- Nemasno crveno meso – dobar izvor željeza (35% bioraspoloživo), vitamina B skupine, posebno B_{12}, Q_{10}, karnitin, Zn, Se

Misner, Bill. 'The Great Animal Versus Vegetable Protein Debate What Is The Best Protein For Muscle Growth?' E-Caps Inc. andamp; Hammer Nutrition Ltd. 2000. Online. http://www.afpafitness.com/articles/AnimalvsVegetable.htm

Prednosti bjelančevina iz biljnih izvora (soja i proizvodi od soje)

- Cjelokupan izvor bjelančevina (sadrži sve aminokiseline)
- Smanjuje vrijednosti LDL-kolesterola u serumu
- Potiče anaboličku aktivnost, pomaže u otklanjanju masnih naslaga i u izgradnji mišićne mase
- Sadrži isoflavone koji djeluju kao
  - Antioksidansi
  - Fitoestrogeni
- Preporuka 30 g/dan

Misner, Bill. 'The Great Animal Versus Vegetable Protein Debate What Is The Best Protein For Muscle Growth?' E-Caps Inc. andamp; Hammer Nutrition Ltd. 2000. Online. http://www.afpafitness.com/articles/AnimalvsVegetable.htm

Važnost ugljikohidrata

Način uzimanja

- Konzumirati u 2-3 dnevnih obroka redovito.
- Konzumirani u količini od 0,5 kg/dnevno čime čuvamo energetske rezerve za umne i tjelesne napore.

Najbolji izvori

Uloga masti

Važnost i funkcija

- Važne su za normalan rad organizma, u njima su otopljeni vitamini A, D, E i K.
- Spori izvor energije - slabo se troše kod većih napora i onih koji trebaju «brzu» energiju.
- U prehrani žena u menopauzi (baš kao i na drugim jelovnicima, trebale bi više biti zastupljene nezasićene od zasićenih masnih kiselina) što znači da bi se jelo trebalo pripremati na ulju biljnog podrijetla

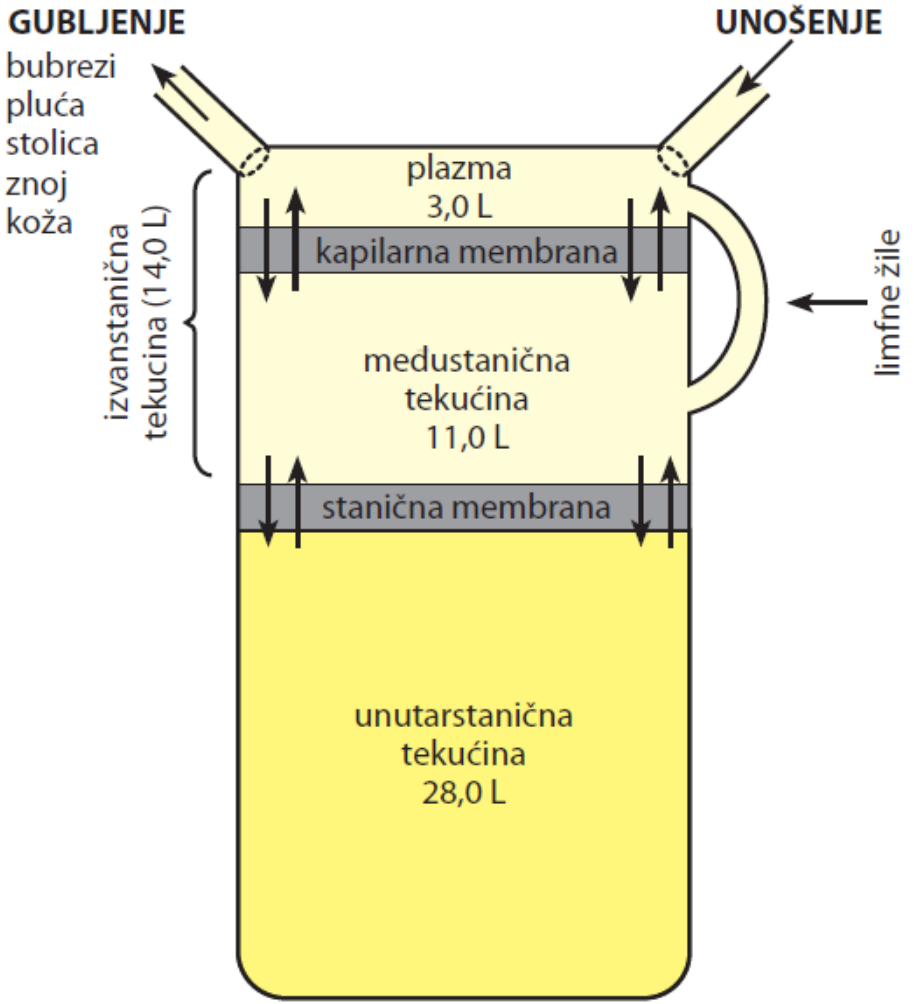
Najbolji izvori

Voda i hidriranje organizma u menopauzi

Voda u tijelu

- Čini 50 do 70 posto tjelesne mase čovjeka.
- Neophodna je za prijenos kisika (respiracijski proces), hranjivih sastojaka (glukoze, vitamina, željeza i drugih), održavanje tjelesne temperature, provođenja metaboličkih, biokemijskih procesa, kao i tijekom probave i apsorpcije.
- Kako se voda gubi tijekom naprezanja – znojenjem i insenzibilnom perspiracijom – određeni izazov može predstavljati razina elektrolita (magnezij, natrij, kalij …)

Raspodjela vode u organizmu



Petrović Peroković V, Weygand-Đurašević I, Verbanac D. Biokemija - udžbenik biokemije za 3. razred medicinskih škola / Bukan, Goran (ur.). Zagreb : Školska knjiga, 2014.

Voda i elektroliti nakon bilo koje tjelesne ili umne aktivnosti

- Žene moraju unijeti veće količine tekućine obogaćene elektrolitima, kao što su **izotonički napici, prirodna mineralna voda ili mješavina od pola čaše soka naranče, druge polovice vode i prstohvata soli.**

- Ako je homeostatski stupanj hidracije organizma potrebno ostvariti unutar 24 sata ili ako su izgubljeni značajni kilogrami tjelesne težine (više od 5% tjelesne mase), tada se preporučuje **strukturirani odgovor** kako bi se odgovarajuće nadomjestili tekućina i elektroliti.

Schoenfeld BJ, Aragon AA, Krieger JW. The effect of protein timing on muscle strength and hypertrophy: a meta-analysis. J Int Soc Sports Nutr 2013; 10: 53.
Shirreffs SM, Sawka MN. Fluid and electrolyte needs for training, competition, and recovery. J Sports Sci 2011; 29 Suppl 1: S39-46.

Pojedini dijelovi predavanja mogu se pronaći ovdje:

diagnostics

MDPI

Review

The Role of Gut, Vaginal, and Urinary Microbiome in Urinary Tract Infections: From Bench to Bedside

Tomislav Meštrović [1,2,†], Mario Matijašić [3,*,†], Mihaela Perić [3], Hana Čipčić Paljetak [3], Anja Barešić [4] and Donatella Verbanac [5]

Diagnostics 2021, 11, 7. https://dx.doi.org/10.3390/diagnostics11010007

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† These authors contributed equally to this work.

Menopauza je stanje –osnovne osobine

Negativne:

- Prvi simptom je umor i iscrpljenost (90% žena)
- Neurovegetativni simptomi:
  - Naleti vrućine (50 – 90 %)
  - Znojenje (50 – 90 %)
  - Vrtoglavica, glavobolja (~ 50 %)
  - Palpitacije srca (~ 35 %)
- Psihički simptomi:
  - Poremećaji spavanja i loš san (50 – 70 %)
  - Depresivna raspoloženja (~ 50 %)
  - Razdražljivost, nervoza, letargija
- Urogenitalna atrofija (80 – 90 %)
- Kardiovaskularne bolesti, osteoporoza, smetnje vida

Pozitivne:

- Jednostavnije obavljanje svakodnevnih aktivnosti
- Znatno smanjena vjerojatnost od nastanka anemije
- Nestanak zabrinutosti oko neželjenih trudnoća
- Optimizam oko budućnosti
  - Jasan pogled u ono što budućnost donosi

Osteoporos Int (2014) 25:2359–2381
DOI 10.1007/s00198-014-2794-2

POSITION PAPER

Clinician's Guide to Prevention and Treatment of Osteoporosis

F. Cosman · S. J. de Beur · M. S. LeBoff · E. M. Lewiecki · B. Tanner · S. Randall · R. Lindsay

- Opće preporuke uključuju i prehranu, a odnose se na :
  - ukupan unos kalcija
    - 1000 mg/dan - za muškarce životnoj dobi od 50. do 70. godine života
    - 1200 mg/dan - za žene nakon 51. i muškarce nakon 71. godine života
  - ukupan unos vitamina D
    - 800-1000 IU/dan
  - unos hrane obogaćene tim sastojcima

Calcif Tissue Int (2016) 98:1–17
DOI 10.1007/s00223-015-0062-x

REVIEW

Effects of Dairy Products Consumption on Health: Benefits and Beliefs—A Commentary from the Belgian Bone Club and the European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases

Serge Rozenberg[2] · Jean-Jacques Body[3] · Olivier Bruyère[1] · Pierre Bergmann[4] · Maria Luisa Brandi[5] · Cyrus Cooper[6,7] · Jean-Pierre Devogelaer[8] · Evelien Gielen[9] · Stefan Goemaere[10] · Jean-Marc Kaufman[11] · René Rizzoli[12] · Jean-Yves Reginster[1]

Mliječni proizvodi predstavljaju vrijedan dijetetski „pripravak” :

- zbog visokog sadržaja kalcija i visoke hranjive vrijednosti
- kalcij j iz tih izvora posjeduje visoku bioraspoloživost
- riječ je o dostupnim i relativno jeftinim proizvodima

Brojne nacionalne prehrambene preporuke zagovaraju uzimanje 3 porcija mliječnih proizvoda dnevno (primjerice oko 2,5 dcl mlijeka, oko 50 g sira, jedan jogurt) pri čemu se osigurava preporučeni dnevni unos kalcija

Sadržaj kalcija u pojedinim namirnicama

Table 2 Comparison of the amount of absorbable calcium in calcium-rich foods

Food	Standard serving size[a] (g)	Calcium content/ serving (mg)	Calcium absorbed/ serving (mg)	Servings needed to equal 240 ml milk
Milk	240	300	96	1.0
Yogurt	240	300	96	1.0
Cheddar cheese	42	303	97	1.0
Tofu with calcium	126	258	80	1.2
Bok choy	85	79	43	2.3
Kale	85	61	30	3.2
Broccoli	71	35	21	4.5
Spinach	85	115	6	16.3
Red beans	172	41	10	9.7
White beans	110	113	25	3.9
Pinto beans	86	45	12	8.1
Rhubarb	120	174	10	9.5

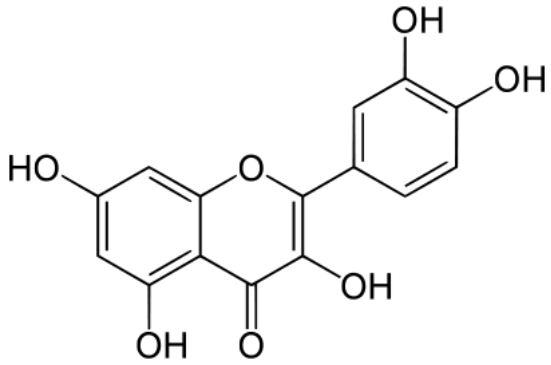
Source Adapted from Weaver 1999 [20]

[a] 1 serving = 240 ml milk; 42 g (1.5 oz) cheese; 85 g green leafy vegetables

Table 1. Food group recommended servings per day

Food group	Recommended servings per day
Vegetables, all types, including starchy	Ad libitum, with a variety of colors represented
Fruits, all types	2-4 servings (1 serving = 1 medium piece or 1/2 cup)
Whole grains (eg, quinoa, brown rice, oats)	6-11 servings (1 serving = 1/2 cup cooked or 1 slice whole grain bread)
Legumes (beans, peas, lentils, soy foods)	2-3 servings (1 serving = 1/2 cup cooked)
Leafy green vegetables (eg, kale, lettuce, broccoli)	At least 2-3 servings (1 serving = 1 cup raw or 1/2 cup cooked)
Nuts (eg, walnuts, almonds, pistachios)	1-2 ounces
Seeds (eg, chia, hemp, and flax seeds)	1-3 tablespoons
Fortified plant milks (eg, soy, almond, cashew)	Optional, 2-3 cups
Fresh herbs and spices	Optional, ad libitum

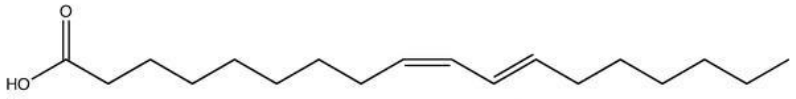
Julieanna Hever, Plant-Based Diets: A Physician's Guide, The Permanente Journal/Perm J 2016 Summer;20(3):15-082



Kvercetin i ostali polifenolni spojevi

- kao zasebne molekule imaju malu bioraspoloživost
- pokazuju aditivni i/ili sinergistički učinak preko transkripcijskih mehanizama posredovanih i s NF-κB, AMPK, PPARγ, PGC-1α
- djeluju kao inhibitori probavnih enzima (npr. miricetin *vs* amilaza)
- smanjuju adipogenezu
- moduliraju mikrobiotu koja njih ujedno metabolizira

Lo Piparo et al. 2008; Rayalam et al. 2008; Del Rio et al. 2011; Zamora–Ros et al. 2014; http://europepmc.org/abstract/MED/16802696



Konjugirana linolna kiselina

- inhibira lipoprotein lipazu i potiče enzime β oksidacije masnih kiselina
- snižava razinu **leptina**

↓

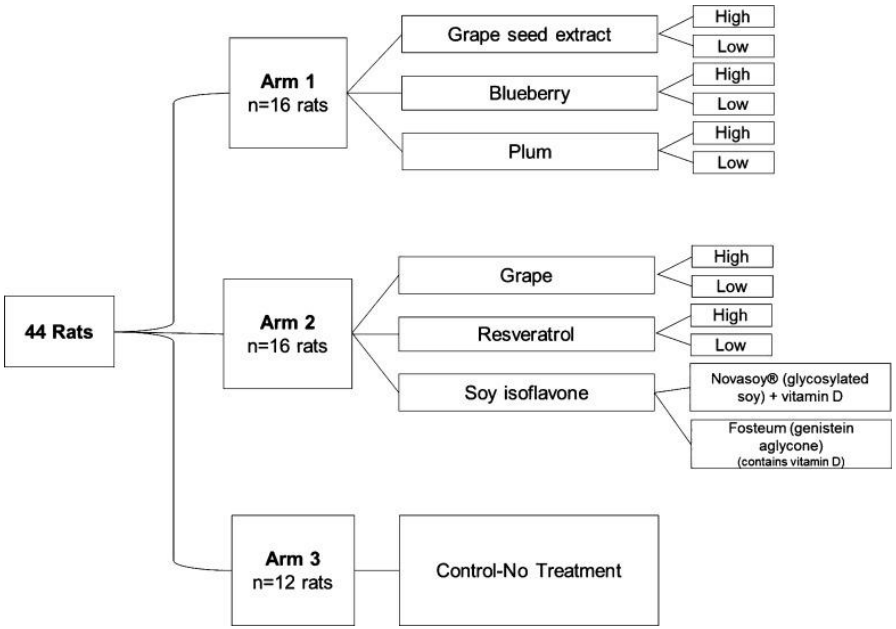
↓ debljina u životinja

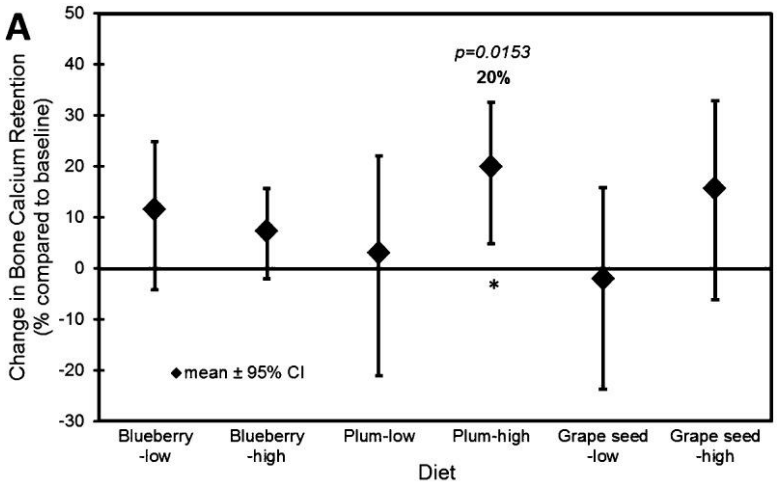
↓ debljina u ljudi

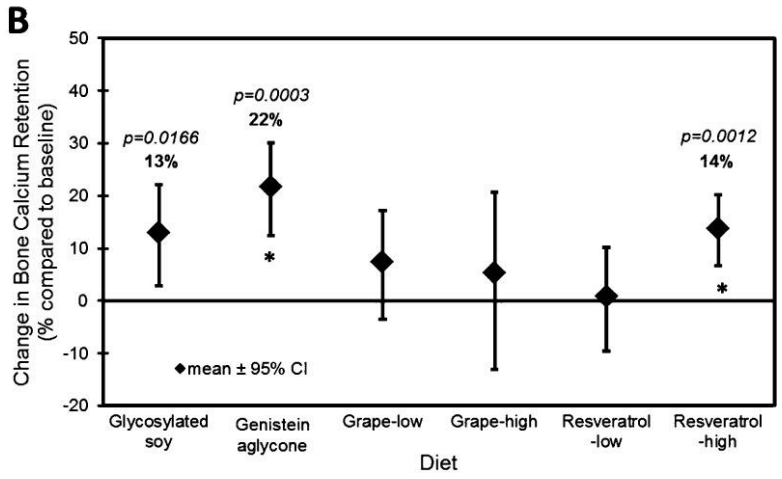
(još uvijek nekonzistentni rezultati)

Nagao and Yanagita 2005; Silveira et al., 2007.

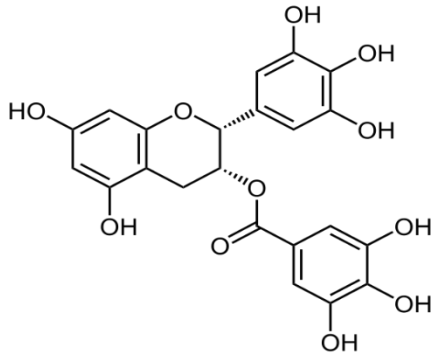
Kelsey M. Mangano; Bone mineral density and protein derived food clusters from the Framingham Offspring Study; J Acad Nutr Diet. 2015 October ; 115(10): 1605–1613



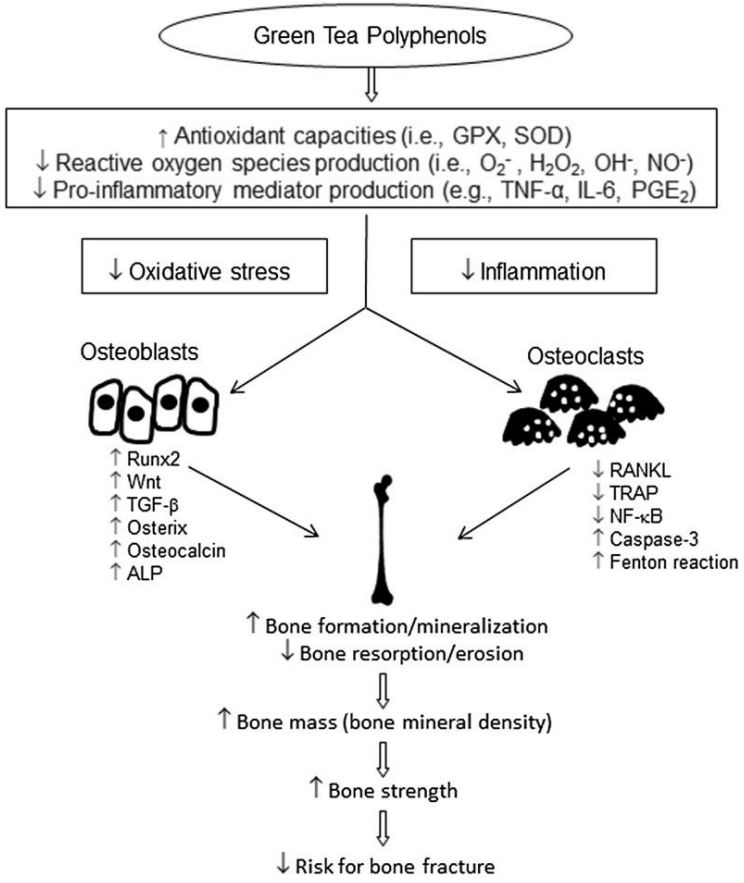




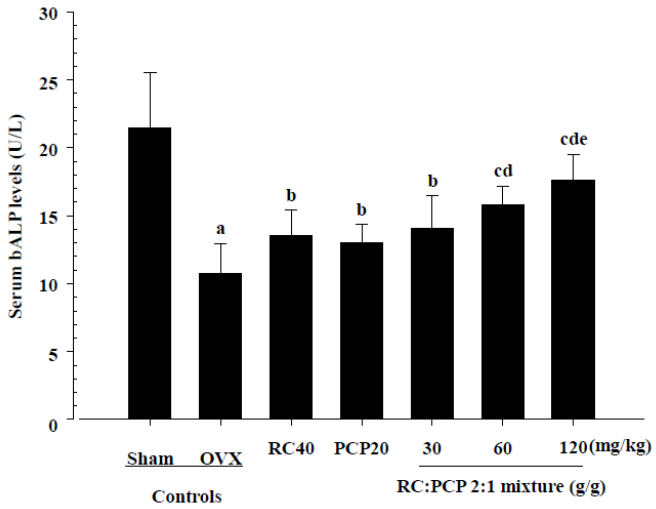
Jessica W. Pawlowski et al.; Plum and Soy Aglycon Extracts Superior at Increasing Bone Calcium Retention in Ovariectomized Sprague Dawley Rats; J. Agric. Food Chem. 2014,62,6108−6117



Katehini poput EGCG



Chwan-Li Shen et al., Tea and bone health: steps forward in translational nutrition, Am J Clin Nutr 2013;98 (suppl):1694S–9S.

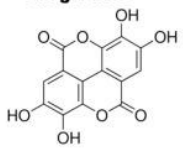


A

Pomegranate peel extract composition (g/100g) of dry matter	
Protein	1,54
Total sugar	81,62
Glucose	27,94
Fructose	32,79
Total fiber	-
Total phenols	15,06
Ellagic acid	2,89
Ellagic acid derivatives	5,08
Punicalagin	3,05
Gallic acid	0,89
Chlorogenic acid	0,021
Coumaric acid	0,047

B

Ellagic acid



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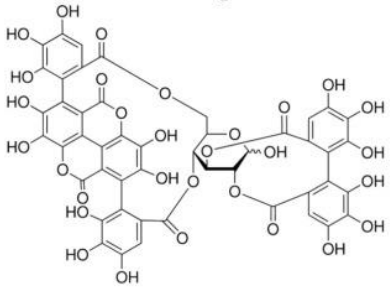

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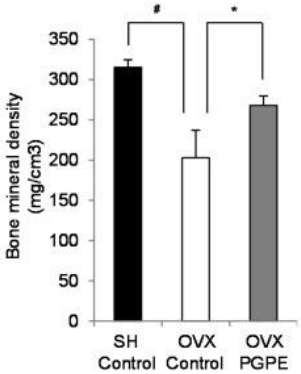
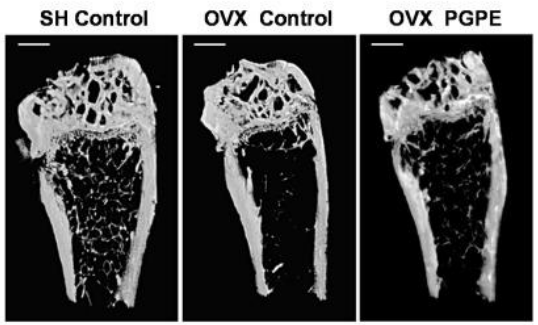


B



Su Jin Kang et al., Dried Pomegranate Potentiates Anti-Osteoporotic and Anti-Obesity Activities of Red Clover Dry Extracts in Ovariectomized Rats; Nutrients 2015, 7, 2622-2647

Mélanie Spilmont et al.; Pomegranate Peel Extract Prevents Bone Loss in a Preclinical Model of Osteoporosis and Stimulates Osteoblastic Differentiation in Vitro; Nutrients 2015, 7, 9265–9284

Mi nismo sami: oni su bili tu mnogo ranije od nas…

International Journal of *Molecular Sciences*

MDPI

Review

Gut Microbiota beyond Bacteria—Mycobiome, Virome, Archaeome, and Eukaryotic Parasites in IBD

Mario Matijašić [1,*], Tomislav Meštrović [2], Hana Čipčić Paljetak [1], Mihaela Perić [1], Anja Barešić [3] and Donatella Verbanac [4]

1 Center for Translational and Clinical Research, University of Zagreb School of Medicine, 10000 Zagreb, Croatia; hana.paljetak@mef.hr (H.Č.P.); mihaela.peric@mef.hr (M.P.)
2 University Centre Varaždin, University North, 42000 Varaždin, Croatia; tomislav.mestrovic@gmail.com
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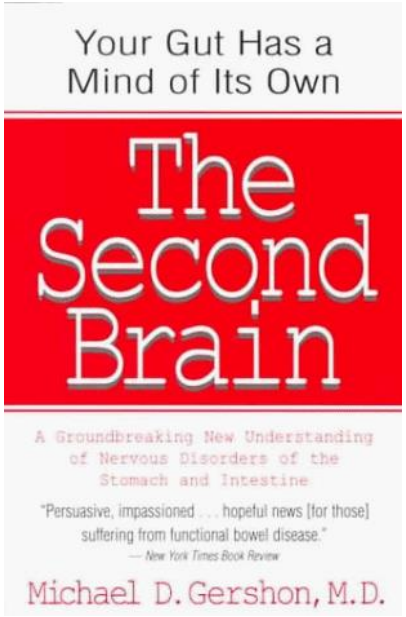
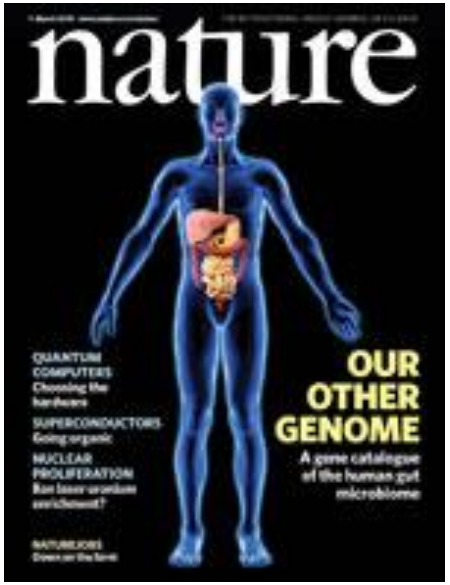
Received: 30 January 2020; Accepted: 7 April 2020; Published: 11 April 2020

check for updates

Mikrobiota je naš novootkriveni organ





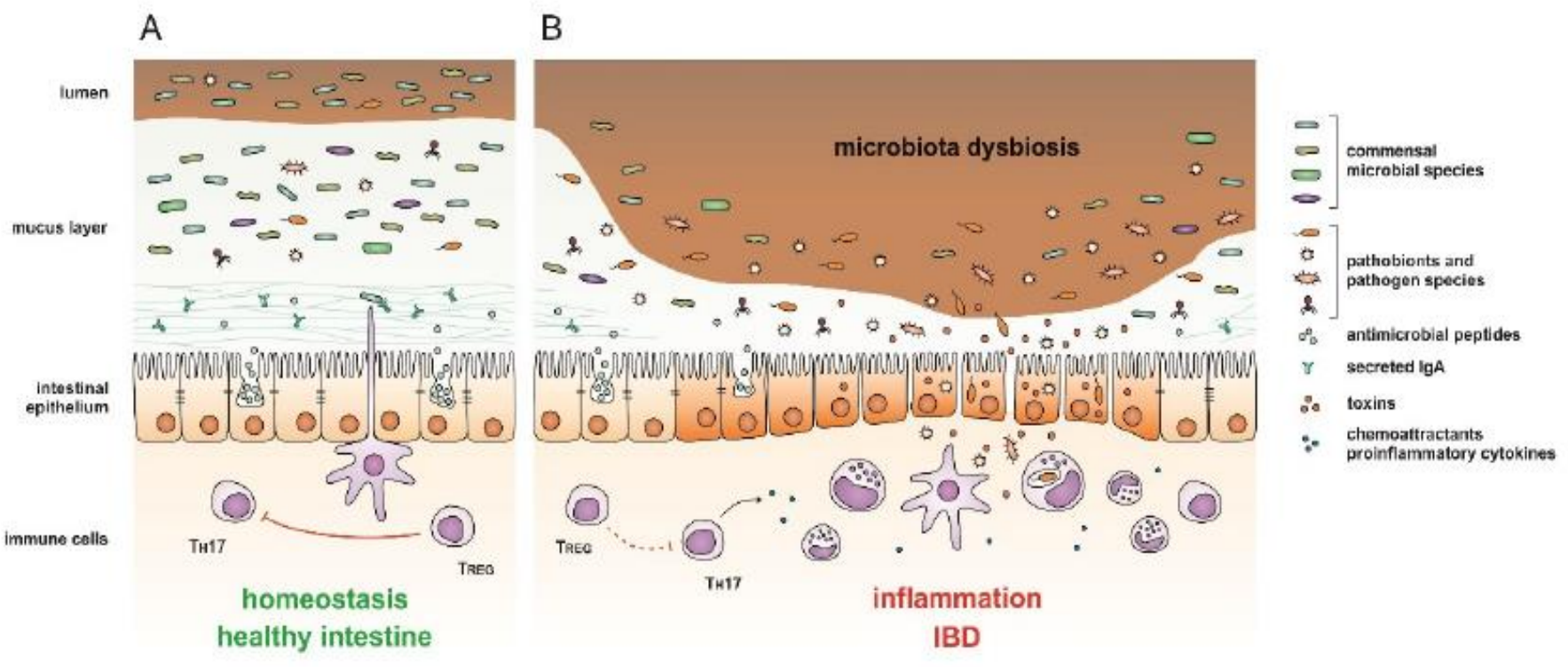
Zdravi smo kad je osigurana dobra probava i raznovrsnost u komunikaciji između:

- eukaritoskih stanica tijela i
- prokariotskih stanica/mikroorganizama koji naseljavaju naše tijelo

„The international MetaHIT (Metagenomics of the Human Intestinal Tract) Project"
The data provide the first insights into this gene set - over 150 times larger than the human gene complement - and permit the definition of both a minimal gut metagenome and a minimal gut bacterial genome.
Project Coordinator ***– Prof. S.D. Ehrlich****"*
Nature, 2011

Poremećaj u ravnoteži crijevne mikrobiote – disbioza

Važnu ulogu u osiguravanju dobre probave ima crijevna mikroflora.



Čak 70 % stanica našega imunosnog sustava nalazi se u crijevima, stoga je ravnoteža u crijevima iznimno važna i za pravilan rad imunološkog sustava.

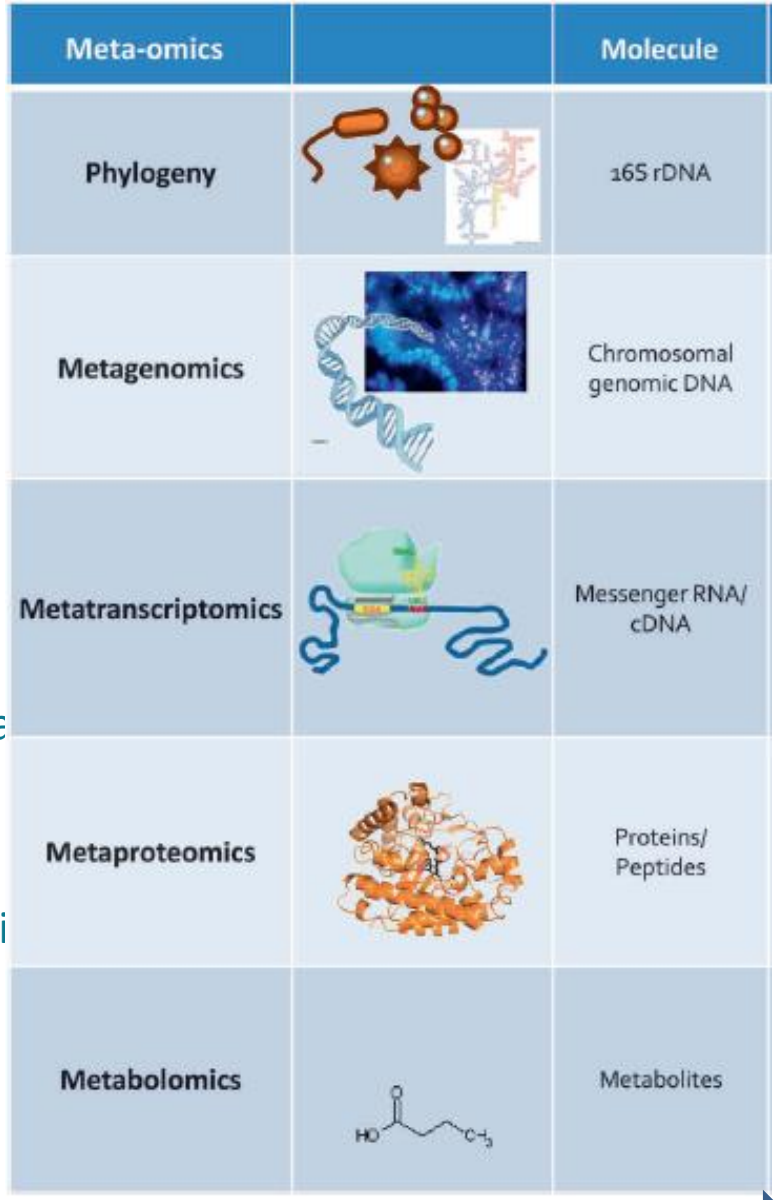
Kronična upala nastupa kod poremećaja ravnoteže mikrobiote i vodi do nastanka kroničnih metaboličkih bolesti

Matijašić et al, Int. J. Mol. Sci. 2020

Metode istraživanja mikrobiote

Lepage, P., Gut, 2013

- **Filogenetska analiza**
  - Sekvenciranje gena za 16S rRNA
  - Sastav, relativna zastupljenost
- **Metagenomika**
  - Sekvenciranje genomske DNA
  - Analiza setova gena – funkcionalna metagenomika
  - Filogenetski odnosi
- **Metatranskriptomika**
  - Analiza cjelokupne mRNA, uvid u diferencija ekspresiju gena
- **Metaproteomika**
  - Analiza ukupnih proteina – različita ekspresi ovisno o uvjetima
- **Metabolomika**
  - Profiliranje metabolizma domaćina i mikrobiote



NAŠ DOPRINOS

SCIENTIFIC REPORTS

OPEN

Methodology challenges in studying human gut microbiota – effects of collection, storage, DNA extraction and next generation sequencing technologies

Received: 6 November 2017
Accepted: 9 March 2018
Published online: 23 March 2018

Marina Panek[1], Hana Čipčić Paljetak[1], Anja Barešić[2], Mihaela Perić[1], Mario Matijašić[1], Ivana Lojkić[3], Darija Vranešić Bender[4], Željko Krznarić[5] & Donatella Verbanac[1]

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Review

Modulating Composition and Metabolic Activity of the Gut Microbiota in IBD Patients

Mario Matijašić [1,*], Tomislav
Marina Panek [1], Darija Vrane
and Donatella Verbanac [1]

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Academic Editors: Terrence Piva
Received: 24 March 2016; Accep

International Journal of *Molecular Sciences*

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Review

Gut Microbiota beyond Bacteria—Mycobiome, Virome, Archaeome, and Eukaryotic Parasites in IBD

Mario M
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Croa
2 Univ
3 Divis
4 Facul
* Corr

Received

diagnostics

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Review

The Role of Gut, Vaginal, and Urinary Microbiome in Urinary Tract Infections: From Bench to Bedside

Tomislav Meštrović [1,2,†], Mario Matijašić [3,*,†], Mihaela Perić [3], Hana Čipčić Paljetak [3], Anja Barešić [4] and Donatella Verbanac [5]

Diagnostics 2021, 11, 7.
https://dx.doi.org/10.3390/diagnostics11010007

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Najnovije spoznaje koje unose potencijal promjene terapijskih pristupa

Gut Microbes

Taylor & Francis
Taylor & Francis Group

The 2021-2022 Journal's Impact **IF of Gut Microbes is 10.245**, which is just updated in 2022.

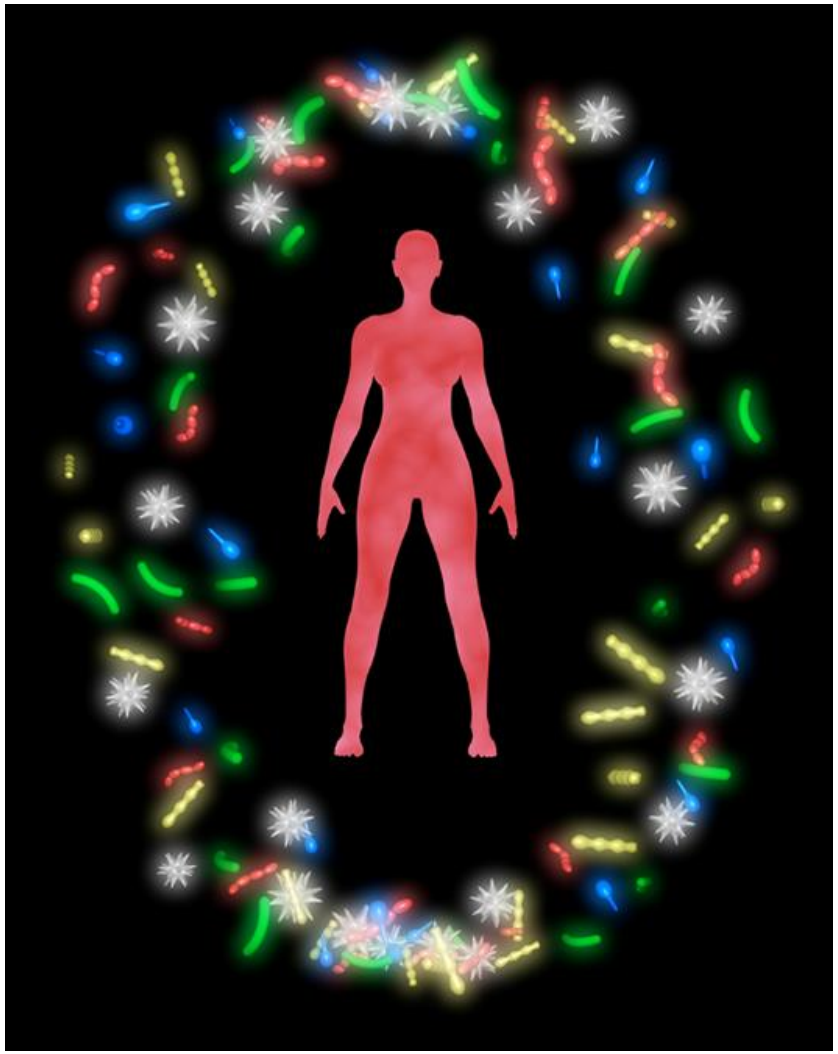
ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/kgmi20

Gut microbiota in mucosa and feces of newly diagnosed, treatment-naïve adult inflammatory bowel disease and irritable bowel syndrome patients

Hana Čipčić Paljetak, Anja Barešić, Marina Panek, Mihaela Perić, Mario Matijašić, Ivana Lojkić, Ana Barišić, Darija Vranešić Bender, Dina Ljubas Kelečić, Marko Brinar, Mirjana Kalauz, Marija Miličević, Dora Grgić, Nikša Turk, Irena Karas, Silvija Čuković-Čavka, Željko Krznarić & Donatella Verbanac

Gut Microbes, 14:1, 2083419, DOI: 10.1080/19490976.2022.2083419

Mogućnosti modulacije mikrobiote

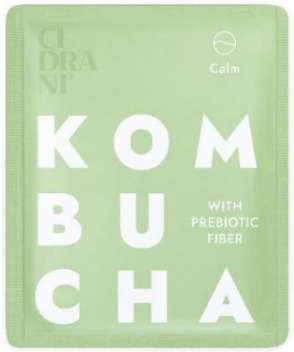


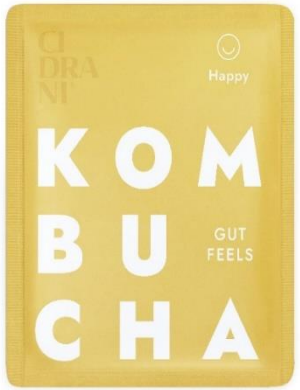
Verbanac et al, Mikrobiota i menopauza, poglavlje u knjizi; Menopauzalna medicina, 2019-2022

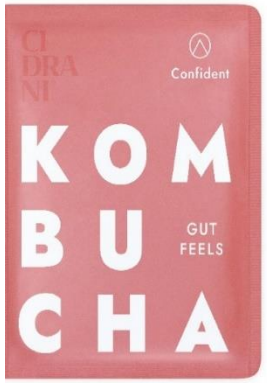
- Utjecaj prehrane
  - Makronutrijenti
  - Mikronutrijenti – vitamini, minerali
- Uloga sna
  - Mikrobiota slijedi diurnalni ritam
- Uloga stresa
  - Adrenalin kao čimbenik rasta štetnih bakterija
- Intervencije u obliku
  - Antibiotika
  - Probiotika
  - Prebiotika

Sinbiotici

- Sinergističke “mješavine” probiotika i prebiotika
  - **Kombucha**
    - Kombucha je fermentirani napitak čija je osnova scoby – sinbiotička kultura bakterija i kvasaca. Od pamtivijeka je kombucha poznata kao kraljica za zdravlje probave.
  - **Synbio**
    - Jabučni ocat s topljivim vlaknima agave







https://cidrani.com/

PREDICT study: Personalized Responses to Dietary Composition

https://joinzoe.com/post/what-is-predict

…the first in a series of large-scale, robust nutritional science studies designed to quantify and predict individual metabolic responses to different foods.

ARTICLES
https://doi.org/10.1038/s41591-020-0934-0
nature medicine
Check for updates

Human postprandial responses to food and potential for precision nutrition

Sarah E. Berry[1,18], Ana M. Valdes[2,3,18] ✉, David A. Drew[4], Francesco Asnicar[5], Mohsen Mazidi[6], Jonathan Wolf[7], Joan Capdevila[7], George Hadjigeorgiou[7], Richard Davies[7], Haya Al Khatib[1,7], Christopher Bonnett[7], Sajaysurya Ganesh[7], Elco Bakker[7], Deborah Hart[6], Massimo Mangino[6], Jordi Merino[8,9,10,11], Inbar Linenberg[7], Patrick Wyatt[7], Jose M. Ordovas[12,13], Christopher D. Gardner[14], Linda M. Delahanty[15], Andrew T. Chan[4], Nicola Segata[5,18], Paul W. Franks[6,16,17,18] and Tim D. Spector[1,18] ✉

Metabolic responses to food influence risk of cardiometabolic disease, but large-scale high-resolution studies are lacking. We recruited *n* = 1,002 twins and unrelated healthy adults in the United Kingdom to the PREDICT 1 study and assessed postprandial metabolic responses in a clinical setting and at home. We observed large inter-individual variability (as measured by the population coefficient of variation (s.d./mean, %)) in postprandial responses of blood triglyceride (103%), glucose (68%) and insulin (59%) following identical meals. Person-specific factors, such as gut microbiome, had a greater influence (7.1% of variance) than did meal macronutrients (3.6%) for postprandial lipemia, but not for postprandial glycemia (6.0% and 15.4%, respectively); genetic variants had a modest impact on predictions (9.5% for glucose, 0.8% for triglyceride, 0.2% for C-peptide). Findings were independently validated in a US cohort (*n* = 100 people). We developed a machine-learning model that predicted both triglyceride (*r* = 0.47) and glycemic (*r* = 0.77) responses to food intake. These findings may be informative for developing personalized diet strategies. The ClinicalTrials.gov registration identifier is NCT03479866.

"More than 1000 people volunteered to take part in PREDICT 1, including 660 identical and non-identical twins from the TwinsUK cohort, providing detailed measurements covering a wide range of markers from blood glucose, fat and insulin levels to exercise, sleep and gut bacteria (microbiome). "

Nature Medicine | VOL 26 | June 2020 | 964–973 | www.nature.com/naturemedicine

PREDICT study: tijek ispitivanja

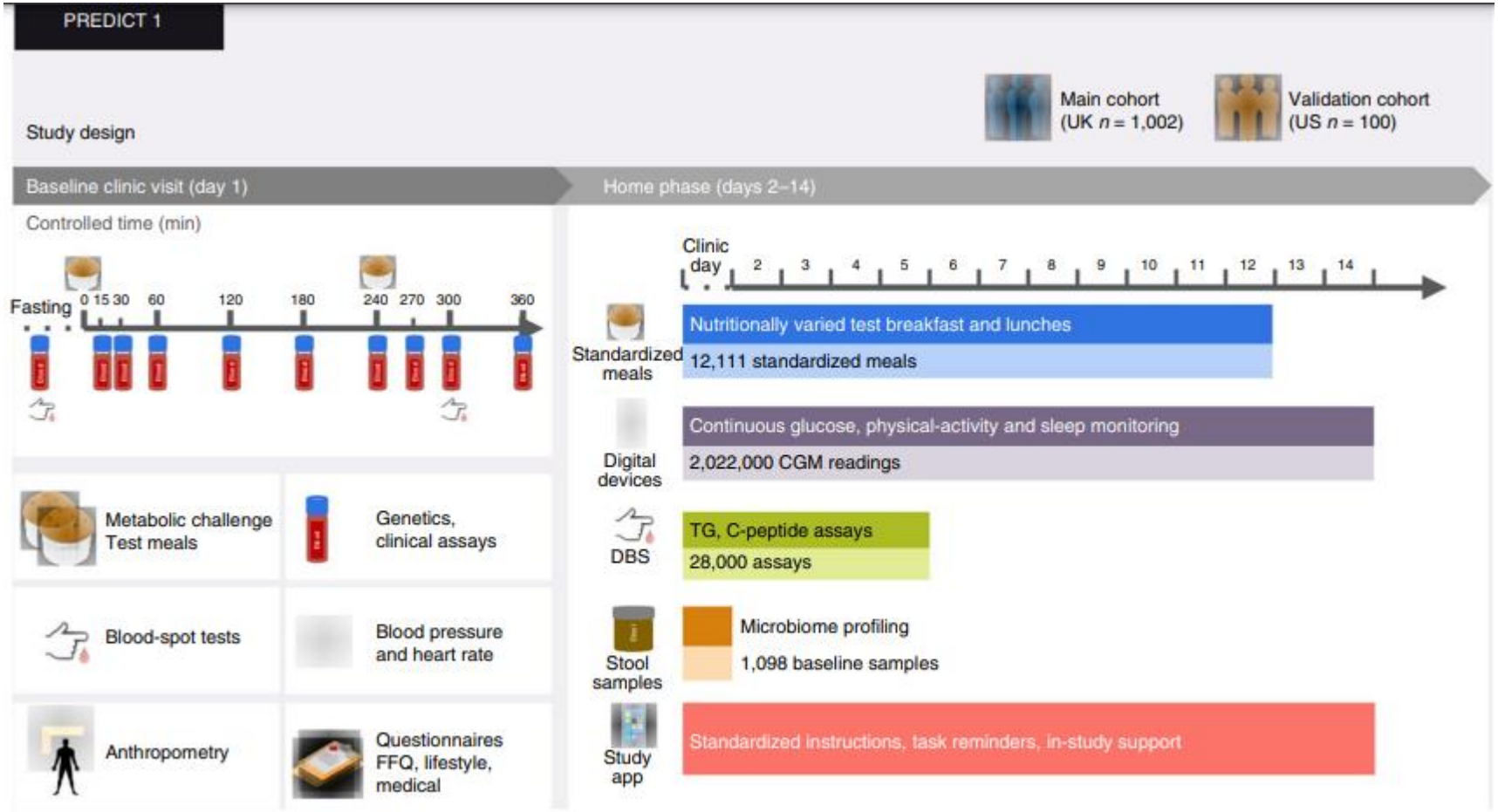


Fig. 1 | Experimental design. The PREDICT 1 study comprised a primary UK-based cohort (n_{max} = 1,002 participants) and an independent US-based validation cohort (n_{max} = 100 participants). TG, triglyceride.

Nature Medicine | VOL 26 | June 2020 | 964–973 | www.nature.com/naturemedicine

ZAKLJUČCI

Osnovni principi prehrane žena u menopauzi

- Važno je tijekom tjedna unijeti različite namirnice:
  - **Tridesetak različitih namirnica tjedno**, uglavnom biljnog porijekla – hranite se po duginim bojama.
- Obrokom treba unijeti točno određenu količinu prehrambene tvari koja odgovara našoj dobi, građi i potrebama.
- Koristiti na dnevnoj osnovi:
  - Kefir
  - Kiseli kupus
  - Kombucha
  - Kimchi
- Pokušati koristiti namirnice u izvornom obliku
  - Izbjegavati procesiranu hranu
  - Izbjegavati tzv. snack-ove (grickalice, slane i slatke izvan obroka)

Znanstveni projekti kojima je pridružena današnja prezentacija

- «Food forensics – izrada neuronskih mreža i naprednih analitičkih metoda kao alata za forenzičko ispitivanje hrane, dodataka prehrani i ljekovitog bilja» prijavitelja SAMPLE CONTROL d. o. o. i partnera Sveučilišta u Zagrebu Farmaceutsko-biokemijski fakultet (KK.01.2.1.02.0142)

- «Inovacijski vaučeri za MSP-ove»; prijavitelja CIDRANI j.d.o.o. i partnera Sveučilišta u Zagrebu Farmaceutsko-biokemijski fakultet (KK.03.2.2.03.0371)

- «Gensko, proteinsko i RNA profiliranje kolorektalnog karcinoma primjenom tekuće biopsije»; CRCMolProfil (HRZZ broj IP-2019-04-4624)

fF Food Forensic

HAMAG BICRO

HrZZ Croatian Science Foundation

CRC MolProfil

Pitanja?

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Donatella.Verbanac@gmail.com