
Revisiting the health aspects of beer
MASTER BREWERS
ESTD 1887
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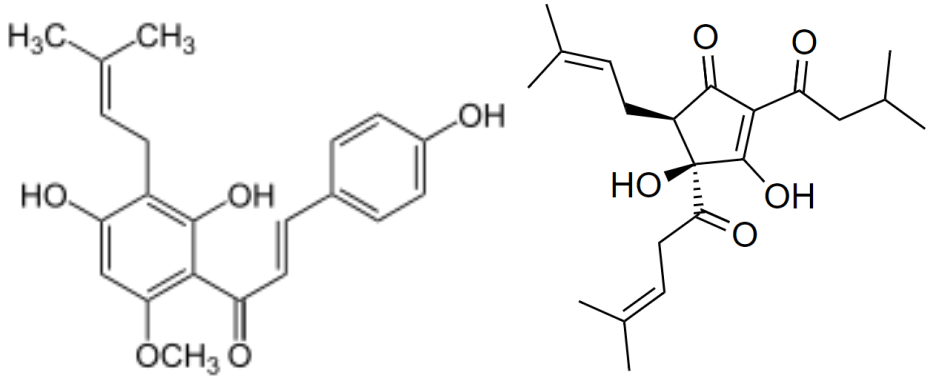
Here we go again!

- Beer has been reported as being healthy & nutritious for millennia
- Egyptians, Greeks, Romans
- During the middle ages, ……
- French paradox (200 years ago)
  - French more healthy than Irish
  - Based on wine consumption
- Mediterranean diet
  - Wine, olive oil, …..

Broad chemical groups

- Proteins and amino acids
  - 100’s of individual proteins
  - high proline in storage protein
- Non-fermentable sugars
  - Some calories
- Fiber
- Antioxidants/phytochemicals
  - Phenols and polyphenols
- Minerals
  - Zn, Si, Mg, K, Se, Ca
- Vitamins
  - 7 B group



Hop flavonoids, particularly xanthohumol (XN), are substances with hypoglycemic, anti-hyperlipidemic, and anti-obesity activities. Iso-α-acids (IAA) and matured hop bitter acids (MHBA) improve health by influencing lipid metabolism, glucose tolerance, and body weight.

Positive info

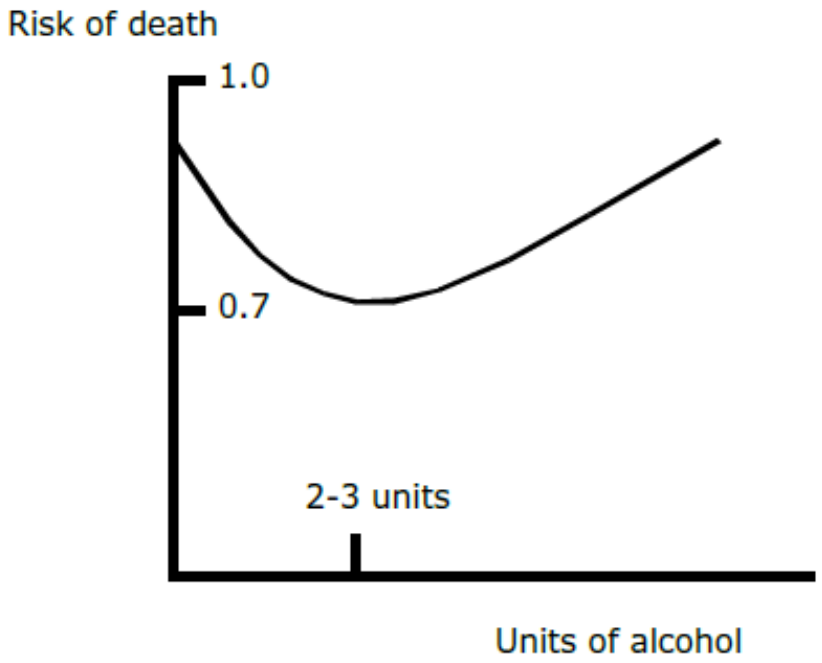
- More nutritious than other alcoholic drinks
- Helps protect your heart
- Helps prevent kidney stones
- Lowers bad cholesterol
- Strengthens your bones
- Helps improve memory
- Helps cognitive function
- NABs all this, less the alcohol!

frontiers in Pharmacology

Front Pharmacol. 2018; 9: 530.
Published online 2018 May 22. doi: 10.3389/fphar.2018.00530
PMCID: PMC5972274
PMID: 29872398

Anticancer Activity and Mechanism of Xanthohumol: A Prenylated Flavonoid From Hops (*Humulus lupulus* L.)

Chuan-Hao Jiang,[1,†] Tao-Li Sun,[2,†] Da-Xiong Xiang,[3,4,5] Shan-Shan Wei,[3,4] and Wen-Qun Li[3,4,5,*]



More knowledge : more power

J Family Community Med. 2020 Jan-Apr; 27(1): 29–36.
Published online 2020 Jan 13. doi: 10.4103/jfcm.JFCM_113_19

PMCID: PMC6984028
PMID: 32030076

The status of zinc in type 2 diabetic patients and its association with glycemic control

Dhedhi M. Farooq, Ali F. Alamri, Basmah K. Alwhahabi, Ashraf M. Metwally,[1] and Khalid A. Kareem

Impact of Beer and Nonalcoholic Beer Consumption on th
Controlled Trial

Cláudia Marques, Liliana Dinis, Inês Barreiros Mota, Juliana Morais, Shámila Ismael, Jos
Mafalda Resende, Christophe Espírito Santo, Ana Paula Cortez, André Rosário, Diogo Pe

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Publication Date: June 15, 2022
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Cell Metabolism
Volume 34, Issue 5, 3 May 2022, Pages 681-701.e10

Article

Microbiota alterations in proline metabolism impact depression

Jordi Mayneris-Perxachs [1, 2, 3, 29], Anna Castells-Nobau [1, 2, 3], María Arnoriaga-Rodríguez [1, 2, 3, 4], Miquel Martin [5], Lisset de la Vega-Correa [1, 2, 3], Cristina Zapata [1, 2, 3], Aurelijus Burokas [5, 6], Gerard Blasco [7, 8], Clàudia Coll [9], Anira Escrichs [10], Carles Biarnés [7, 8, 11], José María Moreno-Navarrete [1, 2, 3, 4], Josep Puig [4, 7, 8, 11], Josep Garre-Olmo [12, 13, 14], Rafel Ramos [4, 15, 16], Salvador Pedraza [4, 8, 11], Ramón Brugada [16, 17], Joan Carles Vilanova [11, 16] ...
José Manuel Fernández-Real [1, 2, 3, 4, 29, 30]

Antioxidants

Table 5.14 Phenolic compounds in beer.

Fraction	Examples	Levels (mg/L)
Phenolic alcohols	Tyrosol	3–40
Phenolic acids	Ferulic acid, p-coumaric acid, vanillic acid, caffeic acid, gallic acid	10–30
Phenolic amines and amino acids	Hordenine, tyramine, tyrosine	10–20
Flavan-3-ols	Catechin	0.5–13
	Epicatechin	1–10
Flavan-3,4-diols	Leucocyanidin	4–80
Flavonols	Quercetin, myrecetin, rutin	<10
Condensed polyphenols	Dimeric catechins	5–8
	Polymeric catechins	<1
	Proanthocyanidins	20–60
	Prodelphinidins	3–10

Antioxidants

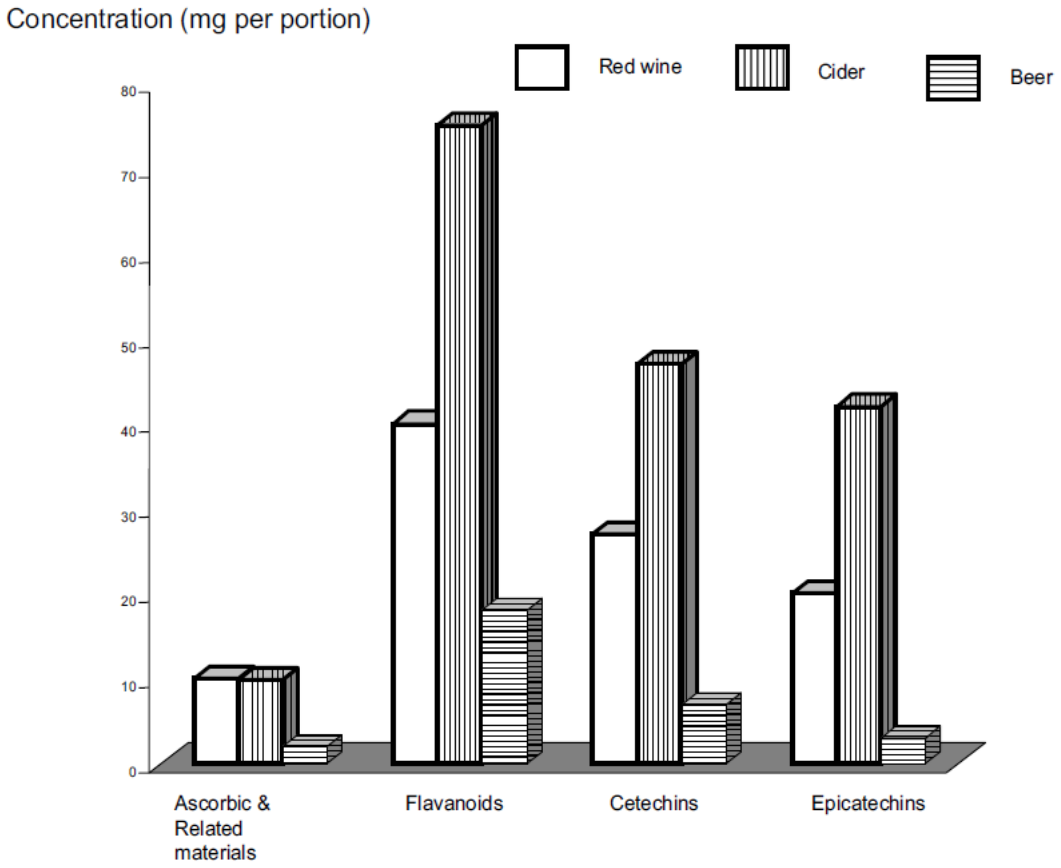

Fig. 5.1 A comparison of antioxidant potential in various alcoholic beverages. (Redrawn from Walker *et al.* 2001a).

Table 5.15 Antioxidant activity of various foodstuffs (based on Walker *et al.* 2001a).

Food	Amount	Total antioxidant activity (µmol Trolox equivalents)
Apple (peeled)	100 g	640
Tomato	100 g	160
White wine	150 mL	220
Black tea	150 mL	1400
Apple juice	150 mL	140
Orange juice	150 mL	400
Beer	500 mL	910–1340
Cider	500 mL	200–5190
Red wine	150 mL	1340–3400

Xanthohumol

Table 2
Prenylflavonoid contents in hops and beer measured by LC–MS/MS [adapted from (Stevens et al., 1999b)]

	Xanthohumol	Isoxanthohumol	8-Prenylnaringenin	Desmethylxanthohumol
Hop cones (% dry wt):	0.48[a]	0.008	0.002	0.12
Beer (μg/L)[b]:	Xanthohumol	Isoxanthohumol	8-Prenylnaringenin[d]	Total[c]
US major brand				
Lager/pilsner	34	500	13	590
Lager/pilsner	9	680	14	750
Lager/pilsner	14	400	17	460
Lager/pilsner	–	–	–	–
Northwest/US microbrews				
American porter	690	1330	240	2900
American hefeweizen	5	300	8	330
Strong ale	240	3440	110	4000
India pale ale	160	800	39	1160
Imported beers				
European stout	340	2100	69	2680
European lager	2	40	1	43
European pilsner	28	570	21	680
European pilsner	12	1060	8	1100
Other				
Non-alcohol beer	3	110	3	120

[a] The content of xanthohumol in hops can vary from 0.1% or less for aged hops to over 1% for high xanthohumol-producing varieties.
[b] Most beers contain no desmethylxanthohumol due to thermal isomerization in the brew kettle.
[c] Minor prenylflavonoids contributing to the total include 6-prenylnaringenin and 6-/8-geranylnaringenin.
[d] Tekel and co-workers developed a GC–MS method for analysis of 8-prenylnaringenin in beer and found concentrations ranging from 5 (limit of quantitation) to 19.8 μg/L in Belgian and other beers (Tekel et al., 1999).

Ferulic acid

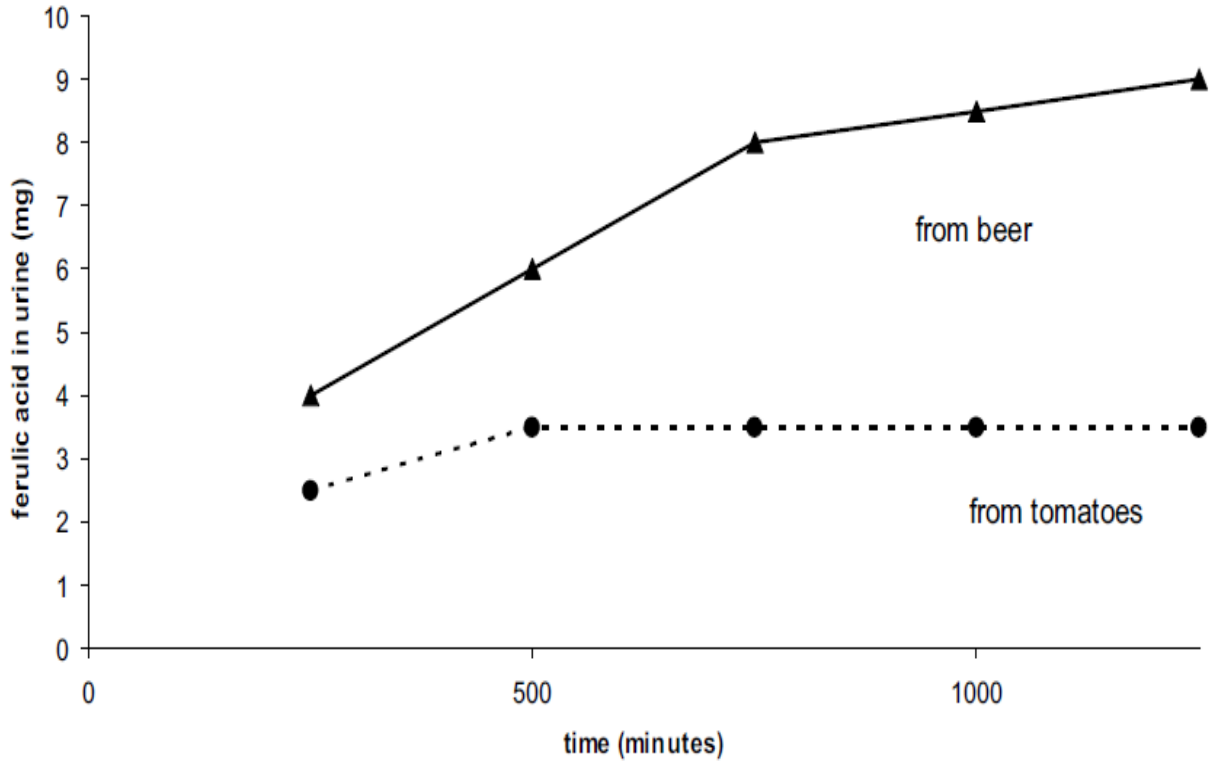

Fig. 6.2 Uptake of ferulic acid from beer and tomatoes. (Redrawn from Bourne *et al.* 2000.)

Vitamins in beer

Table 5.7 Vitamin content of beers.

Vitamin (µg/L)	Derived from Hough *et al.* (1982)		Derived from Moll (1994)
	Lagers	Ales	
Biotin	7–18	11–12	2–15
Nicotinic acid	4494–8607	7500–7753	3000–8000
Pantothenic acid	1093–1535	1375–1808	40–2000
Pyridoxine	329–709	341–546	70–1700
Ribo avin	219–420	331–575	20–800
Thiamine	15–58	59–181	3–80
Folic acid			40–600
B_{12}			3–30

Minerals in beer

Table 5.9 Mineral content of beers.

Inorganic component (mg/L)	British beers*	German beers*	Lager-style beers*	Unspecified†
Potassium	330–1100	396–562 (476)	253–680 (362)	200–500
Sodium	40–230	9–120 (35)	15–170 (58)	20–110
Magnesium	60–200	75–250 (114)	34–162 (82)	60–140
Calcium	40–140	3.8–102 (32.7)	10–135 (46)	20–160
Iron	0.1–0.5	0.02–0.84 (0.02)	0.04–0.44 (0.12)	0.01–0.3
Copper	0.3–0.8	0.04–0.8 (0.19)	0.01–0.41 (0.11)	0.02–0.4
Zinc		0.1–1.48 (0.1)	0.01–0.46 (0.06)	0.02–4.5
Manganese		0.04–0.51 (0.2)		0.03–0.2
Lead			0.06	<0.01–0.1
Arsenic			0.02	<0.02–0.05
Chloride	150–984	143–365 (210)		150–400
Sulphate	150–400	107–398 (182)		60–300
Phosphate	260–400	624–995 (860)		
Phosphorus	90–400			
Nitrate		1.4–101.3 (34)		0–30
Nitrite				0–2
Fluoride		0.08–0.64 (0.15)		0.09–0.2
Cobalt				0.01–0.11
Silica				50–120
Aluminium				0.1–2

*Hough *et al.* (1982).

†Moll (1991).

Values in parentheses represent mean values.

Macbeth, “provoke the desire but take away the performance.”

Not so good news

nature › nature communications › articles › article

Article | Open Access | Published: 04 March 2022

Associations between alcohol consumption and gray and white matter volumes in the UK Biobank

Remi Daviet, Gökhan Aydogan, Kanchana Jagannathan, Nathaniel Spilka, Philipp D. Koellinger, Henry R. Kranzler, Gideon Nave & Reagan R. Wetherill

nature › scientific reports › articles › article

Article | Open Access | Published: 06 May 2022

The effects of modest drinking on life expectancy and mortality risks: a population-based cohort study

Yen-Tze Liu, June Han Lee, Min Kuang Tsai, James Cheng-Chung Wei & Chi-Pang Wen

DRINK THIS, NOT THAT! Expert-Recommended

The #1 Worst Beer Aging You Faster, Says Dietitian

If you're trying to feel and look younger, avoid this beer.

By Emily Shiffer / Published on July 5, 2022 | 10:51 AM

FACT CHECKED BY OLIVIA TARANTINO

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PORTUGAL

'Your good health!': Drinking beer can be good for you, claims study

COMMENTS

By **Mark Armstrong** • Updated: 07/07/2022

Beer makes you fat

- The calories in beer don't make you fat

Table 5.5 A comparison of beer with other foodstuffs—energy, protein, fat, carbohydrate and fibre.

Food	Size of serving (weight or volume)	Energy (kcal)	Protein (g)	Fat (g)	Carbohydrate (g)	Fibre (g)
Beer*	UK pint (568 mL)	250	2.8	0	16	ca. 1
Light beer	UK pint (568 mL)	158		0	9	
Cola	12 uid ounces (355 mL)	152	0	0	38	0
Milk	1 cup	150	8	8	11	0
Tea (black)	6 uid ounces (178 mL)	2	0	0	1	0
Coffee (black)	6 uid ounces (178 mL)	4	0	0	1	0
Wine, white	5 uid ounces (148 mL)	100		0	1	0
Wine, red	5 uid ounces (148 mL)	106		0	2	0
Whisky (80 Proof)	1.5 uid ounces (44 mL)	97		0	0	0
Apple	1 medium	81	0	0	21	4
Banana	1 medium	109	1	1	28	3
Cabbage, cooked	0.5 cup	17	1	0	3	2
Carrot, cooked	0.5 cup	35	1	0	8	3
Lettuce, Iceberg	1 cup	7	1	0	1	1
Tomato	1 medium	26	1	0	6	1
Potato, baked	1	220	5	0	51	5
Bread, white	1 slice	67	2	1	12	1
Corn akes	1 cup	102	2	0	24	1
Spaghetti, cooked	0.5 cup	99	3	0	20	1
Sirloin steak, broiled	3 ounces (85 g)	229	23	14	0	
Pork sausage, cooked	3 ounces	314	17	27	1	
Chicken breast, roasted	3 ounces	141	27	3	0	
Egg, raw	1 large	75	6	5	1	
Cod, cooked (dry)	3 ounces	89	19	1	0	
Cheese. Cheddar	1.5 ounces	171	11	14	1	0
Chocolate, milk	1 bar (1.5 ounces)	226	3	14	26	

https://www.dreamstime.com/stock-photo-hot-dog-burger-fries-french-cheese-plate-fast-food-lunch-red-fabric-surface-image66848373

Health warnings!

Government applies to European Commission for new alcohol consumption warnings

https://www.irishexaminer.com/news/arid-40901312.html?s=03

The Government's statement to the European Commission said it's estimated that 4% of total health expenditure will be on alcohol-related disease for the next 30 years unless Ireland "changes its population's understanding of and relationship with alcohol".

WED, 22 JUN, 2022 - 17:25

SEAN MURRAY

The Temperance Movement

1 TAKE AWAY

Understand there is a wealth of nutrition in beer, but everything in moderation (and exercise regularly)

Resources

- Scientific Principles of Malting & Brewing (2nd), Bamforth & Fox, ASBC
- Beer : Health and nutrition (Bamforth 2004)
- https://cpe.ucdavis.edu/areas-study/brewing

@GlenFox9


Q&A