izione Sport e Benessere

La birra come alimento funzionale dello sportivo

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1) Beer is bad for a sportsman’s health?

2) Beer is good for a sportsman’s health?

3) Sportsman/Athlete ? It’s the same ?

4) What’s beer?

Beer: product of cereal fermentation (worst)

Beer or beers ?

Nutrition for health

Direct action on health

Cultural features

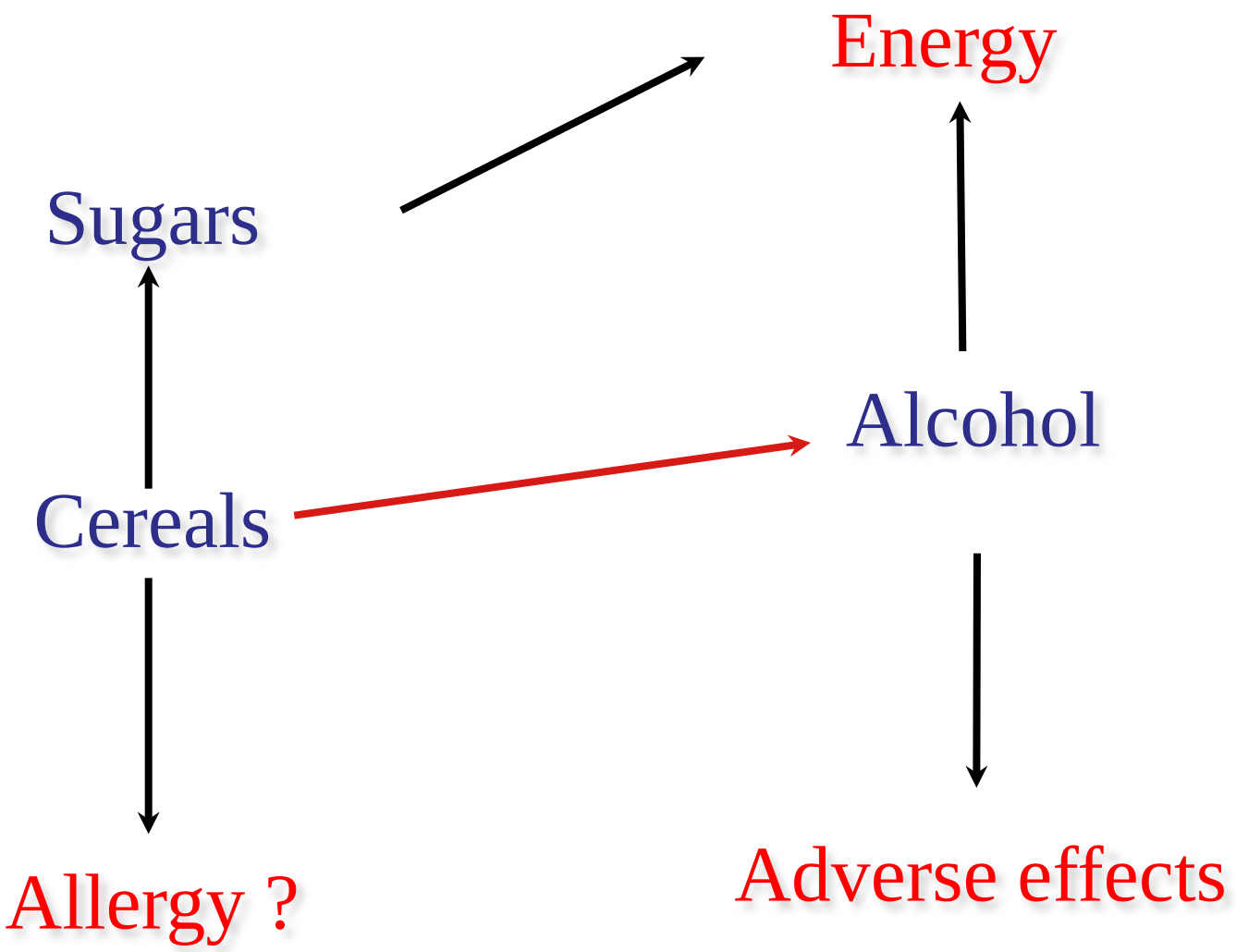
Social features

Water

Generally rich in magnesium and with a good calcium-phosphorus ratio, so positively affecting the nutritional value of the beverage

Cereal

Sugars	about 3-4 grams
Energy	35-40 kcal per 100 ml
Alcohol	4-5 gradi alcolici


Energy
Sugars
Alcohol
Cereals
Allergy ?
Adverse effects

Potential long-term effects of

Ethanol

Red - generally "bad"
Green - generally "good"

Large consumption

Brain:
- Impaired development

- Wernicke-Korsakoff syndrome
  * Vision changes
  * Ataxia
  * Impaired memory

- Psychological
  * Cravings
  * Irritability
  * Antisociality
  * Depression
  * Anxiety
  * Panic
  * Psychosis
  * Hallucinations
  * Delusions
  * Sleep disorders

Mouth, trachea and esophagus:
- Cancer

Blood:
- Anemia

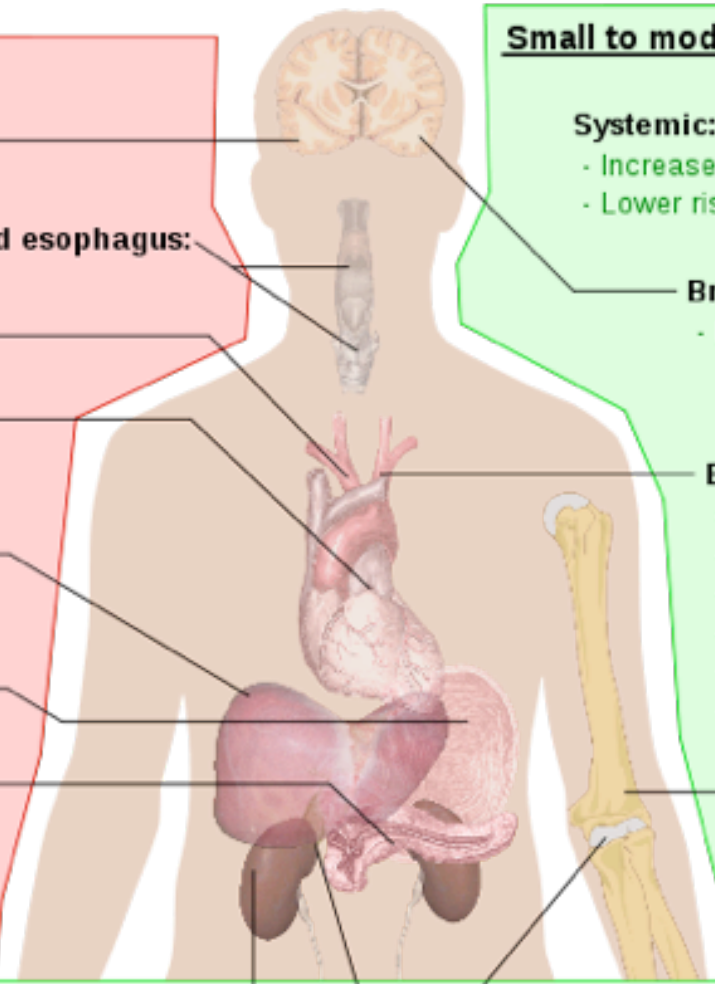
Heart:
- Alcoholic cardio-myopathy

Liver:
- Cirrhosis
- Hepatitis

Stomach:
- Chronic gastritis

Pancreas:
- Pancreatitis

Peripheral tissues:
- Increased risk of diabetes type 2



Small to moderate consumption

Systemic:
- Increases insulin sensitivity
- Lower risk of diabetes

Brain:
- Reduce the number of silent infarcts

Blood:
- Increases HDL
- Decreases thrombosis
- Reduces fibrinogen
- Increases fibrinolysis
- Reduces artery spasm from stress
- Increases coronary blood flow

Skeletal:
- Higher bone mineral density

Effects linked with both small and large consumption

Joints:
- Reduced risk of rheumatoid arthritis

Gallbladder:
- Reduced the risk of developing gallstones

Kidney:
- Reduced risk of developing kidney stones

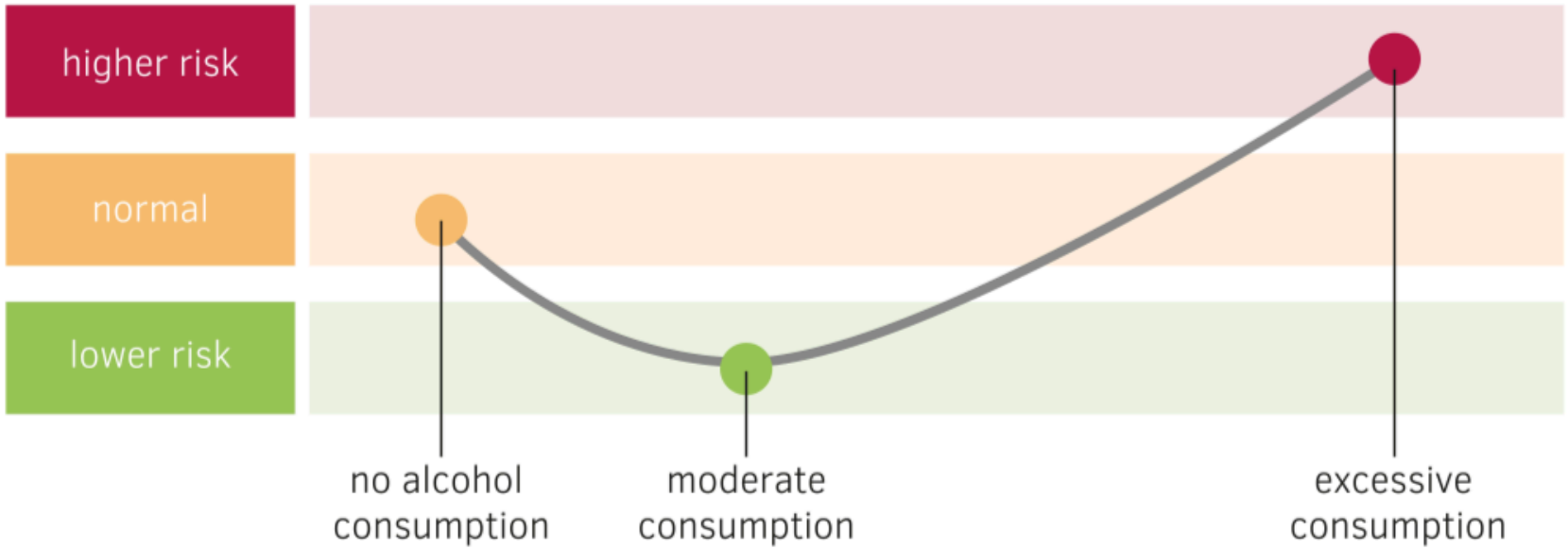
- Not to exceed daily

2 A.U. man
1 A.U. woman
1 A.U. older than 65 yers
1 A.U. 18-21 years
ZERO before 18 years
Higher dose are considered as a greater risk of disease

1 drink = 330 ml of beer (4.5%)
125 ml of wine (12.5%)
40 ml spirit (40%)

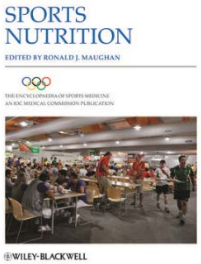
Binge drinking

Moderate alcohol consumption reduces the risk of all-cause mortality.



Total Mortality

- Perhaps the most important health benefit.
- Multiple studies have shown:
  - People drinking moderately tend to live longer than either heavy drinkers or teetotalers.
  - Surprisingly, there's evidence that heavy drinkers still tend to live longer than people who abstain.
- The USDA report concluded that the "evidence suggests that compared to non-drinkers, individuals who drink moderately have a slower cognitive decline with age."



Alcohol, Exercise, and Sport

RONALD J. MAUGHAN[1] AND SUSAN M. SHIRREFFS[1,2]

[1]*School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, UK* [2]*GlaxoSmithKline, Brentford, Middlesex, UK*

As well as being a significant source of energy, providing about 7 kcal (29 kJ) per gram, ethanol has a number of effects that have implications for athletic performance. There are reasons to believe that acute alcohol intake may impair the performance of endurance exercise because of effects on **metabolic, cardiovascular, and thermoregulatory functions,** and that its neurological actions may affect the performance of skilled tasks because of effects on reaction time, neuromotor control, levels of arousal, and judgment.

Excessive intake of alcohol after exercise may directly inhibit glycogen storage while blood alcohol concentration is elevated. The most important effects of alcohol intake on refueling, however, is via a reduced ability, or interest, to achieve dietary goals—i.e., optimum amount and timing of carbohydrate intake (Burke et al., 2003).

Alcohol and motor skills	Low amounts of alcohol (0.02–0.05 g/dL) result in • decreased hand tremors • slowed reaction time • decreased hand-eye coordination Moderate amounts of alcohol (0.06–0.10 g/dL) result in • further slowed reaction time • decreased hand-eye coordination • decreased accuracy and balance • impaired tracking, visual search, recognition, and response skills
Alcohol and strength, power, and short-term performances	Alcohol will not improve muscular work capacity and results in • a decrease in overall performance levels • slowed running and cycling times • weakening of the pumping force of the heart • impaired temperature regulation during exercise • decreased grip strength, decreased jump height, and decreased 200-m and 400-m run performance • faster fatigue during high-intensity exercise
Alcohol and aerobic performance	Adequate hydration is crucial to optimal aerobic performance. The diuretic property of alcohol can result in • dehydration and significantly reduced aerobic performance • impaired 800-m and 1,500-m run times • increased health risks during prolonged exercise in hot environments

Table 1 is directly taken from the following Web site: http://www.uhs.uga.edu/aod/athletic-performance.html.

Alcohol Ingestion Impairs Maximal Post-Exercise Rates of Myofibrillar Protein Synthesis following a Single Bout of Concurrent Training

Evelyn B. Parr1, Donny M. Camera1, Jose´ L. Areta1, Louise M. Burke2, Stuart M. Phillips3,
John A. Hawley4,5*, Vernon G. Coffey6

Conclusion: We provide novel data demonstrating that alcohol consumption reduces rates of MPS following a bout of concurrent exercise, even when co-ingested with protein. We conclude that alcohol ingestion suppresses the anabolic response in skeletal muscle and may therefore impair recovery and adaptation to training and/or subsequent performance.

ACSM POSITION STATEMENT ON ALCOHOL AND ATHLETIC PERFORMANCE

The American College of Sports Medicine states that there is no benefit from alcohol consumption for sports performance. In fact, they emphasize that the use of alcohol can be detrimental to athletic performance. ACSM recommends that alcohol be avoided for at least 48 hours before an event. Postexercise, an athlete should first rehydrate properly with water and/or sports beverages before any alcohol consumption (1).

International Journal of Food and Biosystems Engineering, December, 2016 Vol 1(1) 67-73

Examination of Beer Under the Aspect of its Eligibility as a Fitness Drink

Klaus Krennhuber*, Paul Kuttner and Alexander Jager

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came even close to fulfilling the EU direction. Generally, almost all beers are mineral nutrient containing, as defined by Austrian law. Due to the alcohol concentration none of alcoholic beers are isotonic, as they are hypertonic.Most of the yeast clouded, alcohol free beers are within the isotonic range. Each beer fulfills the EU recommended carbohydrate content but none comes even close to fulfilling the sodium content.The blind tasting of the spiked beers showed minor flavor impairment with sodium carbonate causing the least negative effects on taste and odor. In conclusion, yeast clouded, alcohol-free beer might be labeled as mineral nutrient containing and isotonic, implying to be an ideal sport drink. Due to the lack of sodium the real benefit of such a beverage could diminish unless mixed with beverages containing high levels of sodium or sodium carbonate.

Grain

Brewing →

Polysaccharides → Polysaccharides?

Nutrition, Metabolism & Cardiovascular Diseases (2016) **26**, 443–467

Available online at www.sciencedirect.com

Nutrition, Metabolism & Cardiovascular Diseases

journal homepage: www.elsevier.com/locate/nmcd

ELSEVIER

REVIEW

Effects of moderate beer consumption on health and disease: A consensus document

G. de Gaetano [a,*,1], S. Costanzo [a,1], A. Di Castelnuovo [a,1], L. Badimon [b], D. Bejko [c], A. Alkerwi [c], G. Chiva-Blanch [b], R. Estruch [d], C. La Vecchia [e], S. Panico [f], G. Pounis [a], F. Sofi [g,h], S. Stranges [c], M. Trevisan [i], F. Ursini [j], C. Cerletti [a], M.B. Donati [a], L. Iacoviello [a]

Beer has been included in the human diet since at least 5000 BC and as a product of the fermentation of cereals containing sugars and a variety of important nutrients (Table 1). Beer consists over 90% water; it contains carbohydrates and alcohol whose metabolism in the human body follows the release of an amount of energy.

Results from epidemiological and experimental studies provide inadequate scientific evidence to assess whether beer intake at moderate levels (i.e. <500 mL/day) is associated with general or abdominal obesity [3].

Nutrition, Metabolism & Cardiovascular Diseases (2016) 26, 443–467

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In addition, as a product of the fermentation of cereals, beer includes B-complex vitamins. Most of them are present in small amounts; however, folate and choline content is relatively significant. In particular, 2 cans of 330 mL of a regular beer contain approximately 40 µg of folate and 70 mg of choline [2] that cover almost 10% of the RDA of these vitamins [

Beer also contains trace amounts of minerals such as calcium, iron, magnesium, phosphorus, potassium, sodium, zinc, copper, manganese and selenium, fluoride and silicon

Beer has also been indicated as a rich source of dietary silicon [8] which is important for the growth and development of bone and connective tissue. Clinical studies are however required on the association of beer intake with osteoporosis prevention.

Beer also includes a range of polyphenols such as flavonoids and phenolic acids that contribute directly to several beer characteristics such as flavor, haze, body and fullness [9]. In a recent identification of richest dietary sources of polyphenols [10] using food composition data of the Phenol-Explorer database, regular and dark beer servings of 550 mL took the 57th and 66th ranking positions, respectively.

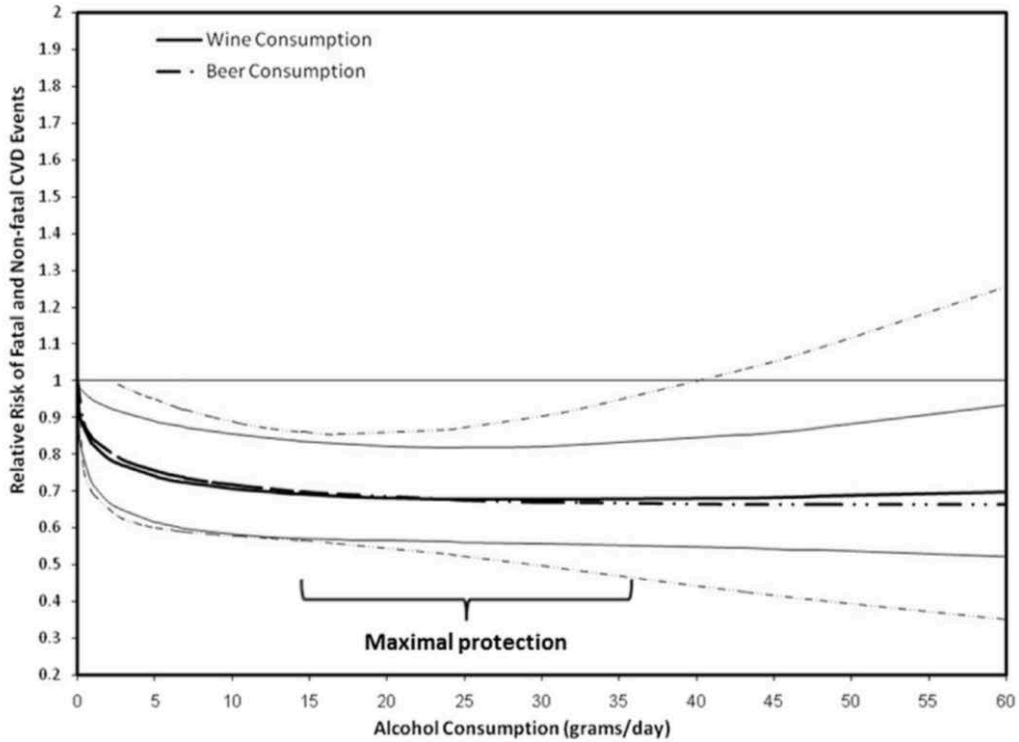


Figure 2 Comparison between curves from wine (solid lines) and beer (dotted lines) intake in relation to CVD risk (modified from Costanzo et al. [17]).

Likewise, the (poly)-phenolic contents in beer have shown different biological activities (shown in enzymatic assays or cell cultures) such as antioxidant, anti-carcinogenic, anti-inflammatory, estrogenic and even antiviral properties. Different profiles of *in vitro* biological activity have been described for these compounds which, combined together, could have a synergistic effect [21].

Low-moderate (up to 1 drink per day in women, up to 2 in men), non-bingeing beer consumption, reduces the risk of cardiovascular disease. This effect is similar to that of wine, at comparable alcohol amounts. Epidemiological studies suggest that moderate consumption of either beer or wine may confer greater cardiovascular protection than spirits.

Evidence consistently suggests a J-shaped relationship between alcohol consumption (including beer) and all-cause mortality, with lower risk for moderate alcohol consumers than for abstainers or heavy drinkers.

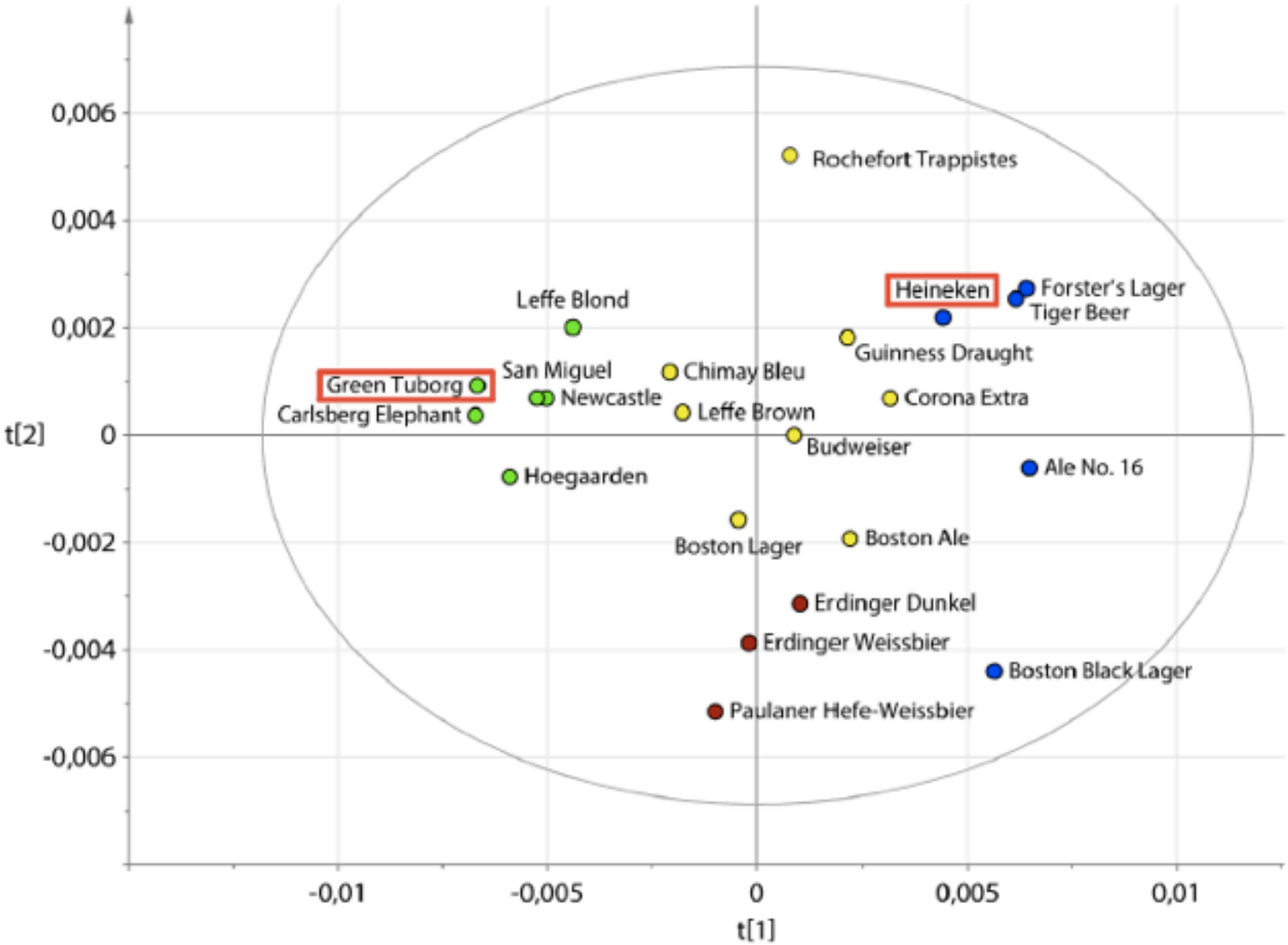
Ramberg *et al. Nutrition Journal* 2010, **9**:54
http://www.nutritionj.com/content/9/1/54

NUTRITION JOURNAL

REVIEW Open Access

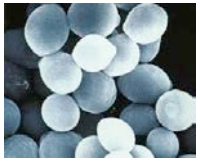
Immunomodulatory dietary polysaccharides: a systematic review of the literature

Jane E Ramberg*, Erika D Nelson, Robert A Sinnott



R2X[1] = 0,573 R2X[2] = 0,194

Yeast



Fermentation, B vit. complex

Hop

But by the 15th century, one vigorous weed crowded out all the others as the fourth ingredient in beer: hops. Hop plants are climbing bines (vines without tendrils). The plant part used in brewing beer is the hop flower, a delicate, pale green, papery cone full of perishable resins. They give a beer bitterness when used early in the brewing process, and aroma when added at the end. As a bonus, hops are a preservative, and extend the life of beer.

Hop

In addition to water, cellulose, and various proteins, the chemical composition of hops consists of compounds important for imparting character to beer.

Alpha acids

Beta acids

Essential oils

Flavonoids

Xanthohumol is the principal flavonoid in hops. The other well-studied prenylflavonoids are 8-prenylnaringenin and isoxanthohumol. Xanthohumol is under basic research for its potential properties, while 8-prenylnaringenin is a potent phytoestrogen.

Hops are of interest for hormone replacement therapy and are under basic research for potential relief of menstruation-related problems

Runners' group

1-1,5 liters of nonalcoholic beer for 3 weeks

vs. non drinkers

Improve of immune response

Decrease of URTI

ACADEMIC PRESS

Fermented Foods in Health and Disease Prevention

2017, Pages 365–384

Chapter 15 – Beer and Its Role in Human Health

M.L. González-SanJosé[1], P.M. Rodríguez[1], V. Valls-Bellés[2]

Show more

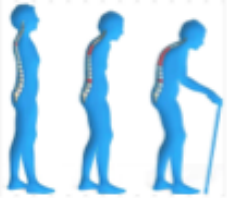
Beer has positive bioactive compounds and thus potential beneficial effects…….

Beer is a drink with high antioxidant capacity due to its phenolic compound, vitamin, and melanoidin content, among other components, ……

The antioxidant capacity of beer has been widely studied, thus demonstrating the relationship between beer consumption and its role in preventing various diseases, …….

associated with an increase in bone-mineral density in postmenopausal women, among other positive effects.

Osteoporosis

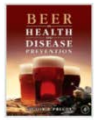


- A survey of 33 studies found drinking increased neck bone density for each drink per day over the range of 0-3 daily drinks; reduced the risk of hip fracture; and was generally associated with reduced bone loss over time, compared with abstaining. (*American Journal of Medicine*, 2008)
- The National Osteoporosis Risk Assessment studied 200,000+ postmenopausal women with no previous diagnosis of osteoporosis. The study found that drinking alcohol significantly reduced the chances of developing osteoporosis. (*Journal of the American Medical Association*, 2001)

ACADEMIC PRESS

Beer in Health and Disease Prevention

2009, Pages 787–794



80 – Moderate Beer Consumption: Effects on Silicon Intake and Bone Health

Ravin Jugdaohsingh, Jonathan J. Powell

Accumulated evidence suggests that dietary silicon (Si) is beneficial for bone and connective tissue health and that higher intakes of dietary Si are associated with higher bone mineral density (BMD) (a proxy for bone health). A major source of Si is whole grain cereals and their products, such as beer, which is brewed from macerated, malted whole grain barley. Beer is a top contributor to Si intake in men and is a source of highly bioavailable Si.

In more recent detailed analyses (Tucker *et al.*, 2007 unpublished data) we confirmed these findings and showed that while the major positive effect of moderate beer ingestion on BMD is an ethanol effect, some could be attributed to Si. Thus *moderate* beer ingestion (1–4 UK units/day) could be advantageous to bone health by providing both an anti-resorptive and an anabolic component, namely ethanol and silicon, respectively.

Cancer Fighting Hops

- The Polyphenols in hops are said to have an anti-carcinogenic effect. That said, because craft beer has approximately 10-30 times more hops than your average industrial mass-produced beers, researches have shown that microbrews can reduce the occurrence of cancers or lessen the severity of cancers that do occur.
- Key is balancing personal risk factors with potential benefits.

Arthritis

- In a study of those who drank regularly, the one-quarter who drank the most were up to 50% less likely to develop rheumatoid arthritis compared to the half who drank the least. (*Ann Rheum Dis.*, 2009)
- A study of 1,877 men and women found that drinking alcohol reduced both the risk and severity of rheumatoid arthritis. Non-drinkers were four times more likely to develop rheumatoid arthritis than people who drank alcohol on more than ten days a month. The risk of developing rheumatoid arthritis decreased according to the frequency of alcohol consumption. (*Rheumatology*, 2010)

Table 1 Composition of different beers and Sport Drink (for 100 g of edible portion)

Components	Beer-stout	Regular beer	Beer low alcohol	Sport drink
General composition				
Alcohol (ethanol) (g)	6.15	3.96	3.5	0
Total energy	278 KJ (67 Kcal)	176 KJ (42 Kcal)	141 KJ (34 Kcal)	134 KJ (32 Kcal)
Total fat (total lipids) (g)	trace	0	0	0
Total protein (g)	0.6	0.5	0.2	0
Water (humidity) (g)	88.5	92.4	97.7	92.1
Carbohydrates				
Sugars (g)	5.3	3.1	2.1	7.9

Table 1 Composition of different beers and Sport Drink (for 100 g of edible portion)

Components	Beer-stout	Regular beer	Beer low alcohol	Sport drink
Niacin total equivalents (Vitamin B3) (mg)	0.815	0.43	0.7	0.9
Riboflavin (Vitamin B2) (mg)	0.055	0.03	0.02	0
Thiamine (Vitamin B1) (mg)	trace	0	trace	0
Vitamin B12 (μg)	0.28	0.15	trace	0
Vitamin B6 (mg)	0.05	0.06	0.05	0.1
Vitamin C (ascorbic acid) (mg)	0	0	0	0
Minerals				
Calcium (mg)	11	8	10	0.8
Total iron (mg)	0.05	0.01	trace	trace
Potassium (mg)	92	37	34	2.2
Magnesium (mg)	16.5	9.6	6	5
Sodium (mg)	11.5	4.4	7	24
Phosphorous (mg)	33.5	55	20	1
Iodide (μg)	8	8	1	1
Total selenium (μg)	1.2	1.2	trace	trace

The day before

Carbo Load ?

1 bottle (330 ml) = 12 gr → 20 grams of bread

Magnesium, vit B6, hop

Diuretic effect

Immediately before ?

Negatively affecting reflexes, thermoregulation energy fluxes

Jiménez-Pavón *et al. Journal of the International Society of Sports Nutrition* (2015) 12:26
DOI 10.1186/s12970-015-0088-5

jissn
journal of the international society of sports nutrition

RESEARCH ARTICLE **Open Access**

CrossMark

Effects of a moderate intake of beer on markers of hydration after exercise in the heat: a crossover study

David Jiménez-Pavón[1,2*], Mónica Sofía Cervantes-Borunda[1], Ligia Esperanza Díaz[3], Ascensión Marcos[3] and Manuel J. Castillo[1]

Abstract

Background: Exercise in the heat causes important water and electrolytes losses through perspiration. Optimal rehydration is crucial to facilitate the recuperation process after exercise. The aim of our study was to examine whether a moderate beer intake as part of the rehydration has any negative effect protocol after a short but dehydrating bout of exercise in the heat.

Beer as a nutraceutical

Abstract

Background: Exercise in the heat causes important water and electrolytes losses through perspiration. Optimal rehydration is crucial to facilitate the recuperation process after exercise. The aim of our study was to examine whether a moderate beer intake as part of the rehydration has any negative effect protocol after a short but dehydrating bout of exercise in the heat.

Results: Body mass (BM) decreased (both ~ 2.4 %) after exercise in both trials. After rehydration, BM and fat free mass significantly increased although BM did not return to baseline levels (BM, 72.6 ± 6.7 to 73.6 ± 6.9; fat free mass, 56.9 ± 4.7 to 57.5 ± 4.5, no differences BW vs W). Beer intake did not adversely affect any measured parameter. Fluid balance and urine excretion values did not differ between the rehydration strategies.

Conclusions: After exercise and subsequent water losses, a moderate beer (regular) intake has no deleterious effects on markers of hydration in active individuals.

o sportivo

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Alcohol and Rehydration

Alcohol has a diuretic action, stimulating urine formation by suppression of vasopressin (ADH) secretion

It was estimated by Eggleton (1942) that ingestion of 1 gram of alcohol increases urine output by 10 ml

Eggleton (1942) also showed that small amounts of alcohol did not impair rehydration in subjects who were already dehydrated

Eggleton MG (1942)
J Physiol 101 172-191

Beer and Health

Alcohol and fluid balance

Alcohol in high doses has a clear diuretic action

The diuretic effect has been estimated at 10 ml of excess fluid loss per gram of alcohol

Drinks with an alcohol content of less than about 10% should result in positive fluid balance

BUT there have been few studies of the effects of high alcohol doses - Ethics Committees do not like these studies

Example 1: pint of beer

Alcohol content	11 g
Volume	564 ml
Excess urine loss	110 ml
Net fluid balance	+ 454 ml

Example 2: nip of whisky

Alcohol content	10 g
Volume	25 ml
Excess urine loss	100 ml
Net fluid balance	-75 ml

Beer and Health

Note that there will be a volume diuresis with beer!

International Journal of Sport Nutrition and Exercise Metabolism, 2013, 23, 593-600
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SPORT NUTRITION AND
EXERCISE METABOLISM
www.IJSNEM-Journal.com
ORIGINAL RESEARCH

Beer as a Sports Drink? Manipulating Beer's Ingredients to Replace Lost Fluid

Ben Desbrow, Daniel Murray, and Michael Leveritt

Purpose: To investigate the effect of manipulating the alcohol and sodium content of beer on fluid restoration following exercise. ***Method***: Seven male volunteers exercised on a cycle ergometer until 1.96 ± 0.25% body mass (mean± *SD*) was lost. Participants were then randomly allocated a different beer to consume on four separate occasions. Drinks included a low-alcohol beer (2.3% ABV; LightBeer), a low-alcohol beer with 25 mmol×L^{-1} of added sodium (LightBeer+25), a full-strength beer (4.8% ABV; Beer), or a full-strength beer with 25 mmol×L^{-1} of added sodium (Beer+25). Volumes consumed were equivalent to 150% of body mass loss during exercise and were consumed over a 1h period. Body mass and urine samples were obtained before and hourly for 4 hr after beverage consumption. ***Results***: Significantly enhanced net fluid balance was achieved following the LightBeer+25 trial (−1.02 ± 0.35 kg) compared with the Beer (−1.59 ± 0.32 kg) and Beer+25 (−1.64 ± 0.28 kg) treatments. Accumulated urine output was significantly lower in the LightBeer+25 trial (1477 ± 485 ml) compared with the Beer+25 (2101 ± 482 ml) and Beer (2175 ± 372 ml) trials. ***Conclusion***: A low alcohol beer with added sodium offers a potential compromise between a beverage with high social acceptance and one which avoids the exacerbated fluid losses observed when consuming full strength beer.

Beer and Health

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EXERCISE METABOLISM
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ORIGINAL RESEARCH

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A low alcohol beer with added sodium offers a potential compromise between a beverage with high social acceptance and one which avoids the exacerbated fluid losses observed when consuming full strength beer.

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separate occasions. Drinks included a low-alcohol beer (2.3% ABV; LightBeer), a low-alcohol beer with 25
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Beer and Health

Manipulations to the Alcohol and Sodium Content of Beer for Postexercise Rehydration

Ben Desbrow, Danielle Cecchin, Ashleigh Jones,
Gary Grant, Chris Irwin, and Michael Leveritt

he addition of 25 mmol·L⁻¹ sodium to low alcohol (2.3% ABV) beer has been shown to enhance post exe
ise fluid retention compared with full strength (4.8% ABV) beer with and without electrolyte modificatio
his investigation explored the effect of sodium manipulations to the sodium and potassium content of beer o
uid restoration following exercise. Twelve male volunteers lost 2.03 ± 0.19% body mass (mean ± *SD*) usin
ycling exercise in a hot environment (30°C) on four separate occasions. Drinks included low alcohol beer with 25 mmol·L⁻¹ of added sodium [LightBeer+25], low alcoh
eer with 50 mmol·L⁻¹ of added sodium [LightBeer+50], mid-strength beer (3.5% ABV) [Mid] or midstrengt
eer with 25 mmol·L⁻¹ of added sodium [Mid+25]. Total drink volumes in each trial were equivalent to 150% o
ody mass loss during exercise, consumed over a 1h period. Body mass, urine samples and regulatory hormone
ere obtained before and 4 hr after beverage consumption. Total urine output was significantly lower in th
ightBeer+50 trial (1450 ± 183 ml) compared with the LightBeer+25 (1796 ± 284 ml), Mid+25 (1786 ± 37
ml) and Mid (1986 ± 304 ml) trials (all $p < .05$). This resulted in significantly higher net body mass followin
he LightBeer+50 trial (-0.97 ± 0.17kg) compared with all other beverages (LightBeer+25 (-1.30 ± 0.24 kg

The electrolyte concentration of low alcohol beer appears to have more significant impact on post exercise fluid retention than small changes in alcohol content

Beer and Health

Beer and sport

	Might be Good	Bad ?
Before	**Minerals, vits, antioxidants supply** **Medium GI CHO s** **Lightly relaxing**	**Diuretic action ? (no if water intake is well balanced)**
Immediately before or during sport act.	CHO supply Water balance	**Thermoregulation, reflexes, neuromuscolar skill ……**
After	**Water balance** **Minerals, vits, antioxidants supply** **Satisfying, rewarding (enjoy your life)**	**Interference with recovery processes, max 500 ml low grade (3,5°-4,5°)**

	Classiche	Meno classiche
Day before	Belgian Triple Bock	Oyster Stout
Immediately after	Bitter Ale Pils	Gose Kolsch Lambic
Well deserved recovery (enjoy your life!)	Trappist, Scotch ale Baltic Porter	“Sour ale ” or “Italian Grape Ale”

Health response

Body response

Nutrients amount/***quality***/

Genetic

Dietary habits + life style

Athlete

To add beer in my nutrition could be advisable ? **No !**

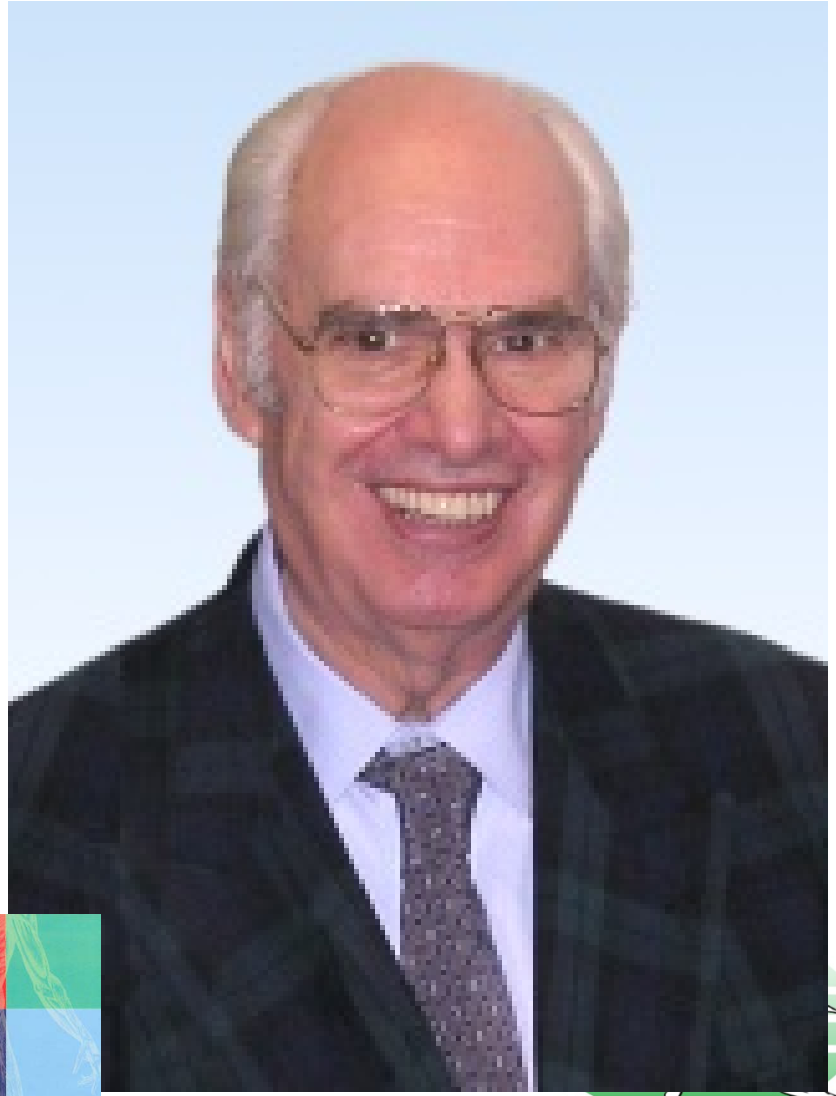
To take off beer from my nutrition could be required? **No !**

Beer could be useful for me? **Yes !**

Athletes vs. active people

Timing/amount

Società Italiana Nutrizione Sport e Benessere



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