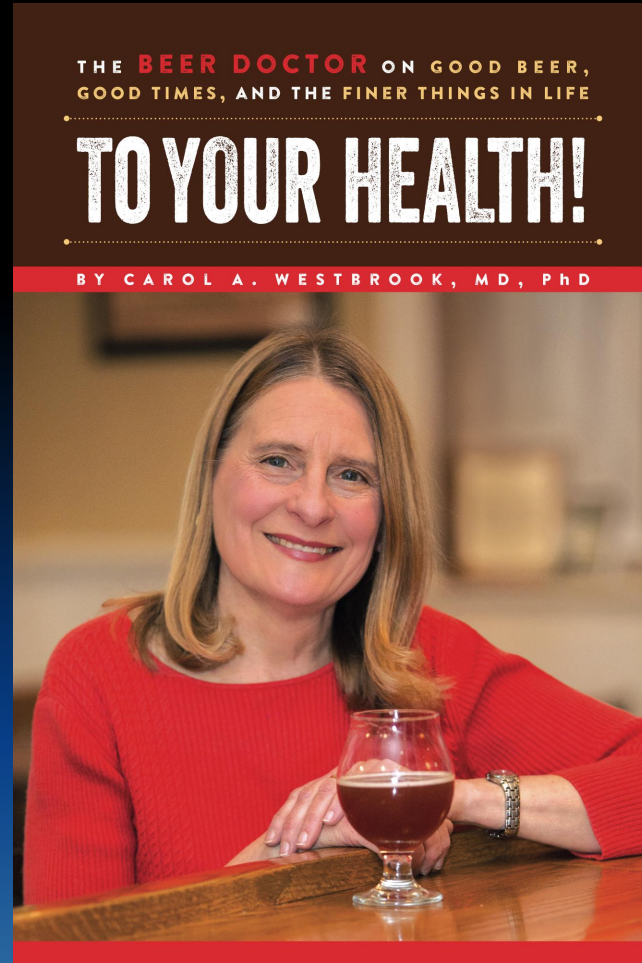
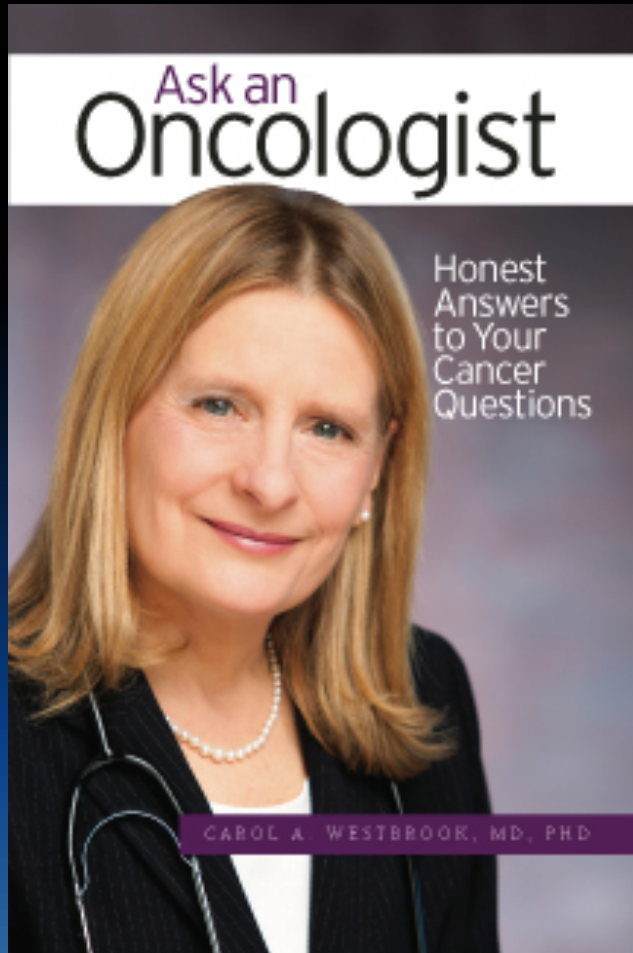


Beer and Your Health: Fact & Fiction

Carol A. Westbrook, MD, PhD



The topic of the day: is beer good for you...or bad?

- Is it nutritious?
- Does it make you fat?
- Is it good for your heart?
- Does it cause cancer?
- How much should you drink (or not drink)?
- How can you stay sober while drinking?

Some of the oldest professions

Brewer



Physician



“A little bit of beer is divine medicine.” ~
Paracelsus, Greek physician



St. Arnold, patron of beer
1040-1087 AD

Early medical uses of beer:

A healthy replacement for water

Free of typhoid, hepatitis, infections

Soothing, sleep-promoting

Appetite stimulating

Antiseptic

Alcohol is a solvent for meds, extracts

Promoted by clergy for health benefits

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Do we still think beer is healthy?

What's in beer? Beer is liquid bread



- Starches and fiber from grain
- Low but complete protein
- **B Vitamins** from yeast
- Minerals: **Mg**, **Se**, **Ph**, **K**, **Ca**, **Si**
- Nutrients from yeast
- Compounds from hops & barley
- Alcohol replaces sugar
- **Low fat, salt, sugar**, Vitamins **C,D,A**

Can man live on beer alone?

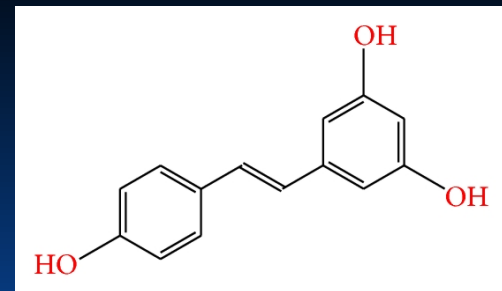
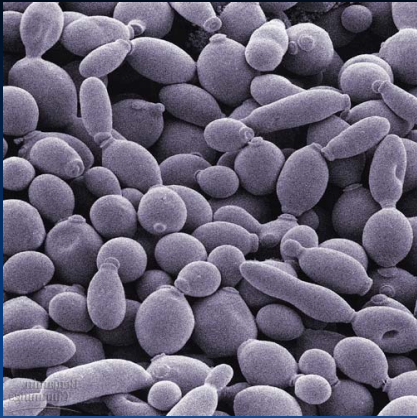
“This is grain, which any fool can eat, but for which the Lord intended a more divine means of consumption... Beer!”

~ Friar Tuck, in *Robin Hood, Prince of Thieves*

- 40 days of Lent
- 40 day of liquid diet
- Will beer suffice? NO!
 - Lacks salt, sugar, fat, Vit C
- Add a slice of lime & a pinch of salt to the beer, and add milk to diet



Now a word about ...Yeast, Hops and Polyphenols



Does beer make you fat?



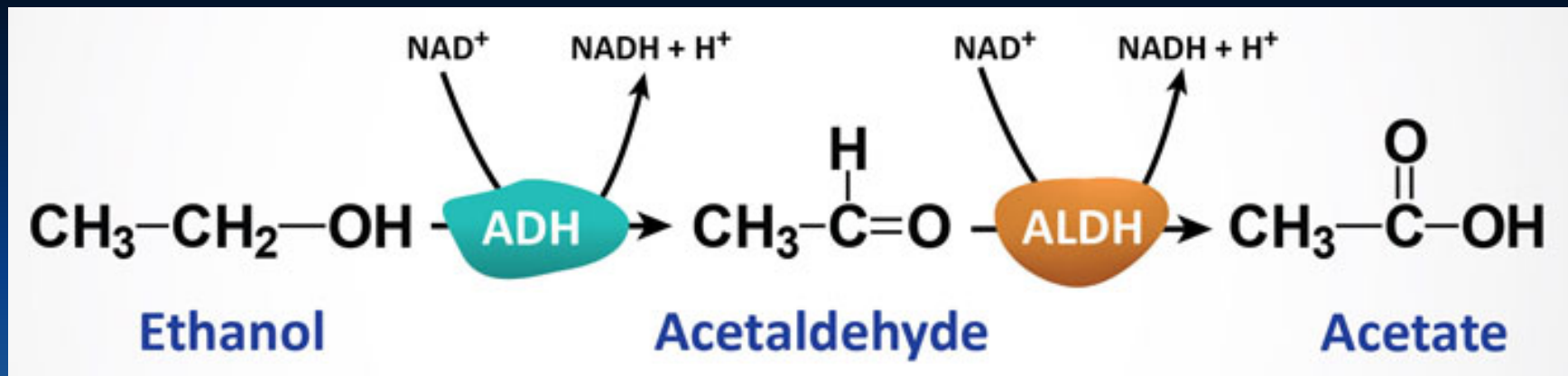
What is the true calorie content of beer?
Is excess alcohol stored as fat in your body?

Nutrition labels on beer

- The USDA label calculates alcohol at 7 cal/g
- **FDA vs. TTB**
- USDA Food and Drug Administration (FDA)
- TTB, Alcohol and Tobacco Trade Bureau, Dept. of Treasury

Nutrition Facts	
Serving Size 1 beer (12 fl oz)	
Servings Per Container 1	
Amount Per Serving	
Calories 150	Calories from Fat 0
% Daily Value*	
Total Fat 0g	0%
Saturated Fat	0%
Trans Fat	0%
Cholesterol	0%
Total Carbohydrate 13g	4.7%
Fiber 8g	40%
Protein 1g	
Contains significant amounts of magnesium, selenium, potassium, phosphorus, biotin, B3 (niacin), B5 (pantothenic acid), B6 (pyridoxin), and B9 (folate), with smaller amounts of B1 (thiamine), B2 (riboflavin), B12 inotisol and choline.	
* Percent Daily Values are based on a 2,000 calorie diet.	
http://www.DrinkingBeer.net - Always a good idea	

Alcohol metabolism



USDA vs. actual calories in alcohol

USDA LABELS BASED ON

- *Alcohol* $\rightarrow 2\text{CO}_2 + 3\text{H}_2\text{O}$ 7 cal/g
- *Alcohol* $\rightarrow \text{C}_2\text{H}_3\text{O-OH}$ 1.4 cal/g

COMPARE TO:

- *Wood* $\rightarrow \text{CO}_2 + \text{H}_2\text{O}$ 4.4 cal/g
- *Wood* \rightarrow *Wood* 0 cal/g

How many calories in my beer? USDA label

12oz bottle, 5% ABV	164 cal
• 11.4 oz water	
• Fat (0 g)	0 cal
(0.6 oz alcohol, 17 g (7 cal/g)	119 cal)
• 1.13 g malt protein (4 cal /g)	5 cal
• 10 g carbohydrate (4 cal/g)	40 cal

How many calories are *really* in my beer?

12oz bottle, 5% ABV

68 cal

- 11.4 oz water

- Fat (0 g)

0 cal

~~(0.6 oz alcohol, 17 g (7 cal/g) ————— 119 cal)~~

(0.6 oz alcohol, 17 g (1.4 cal/g)

23 cal)

- 1.13 g malt protein (4 cal /g)

5 cal

- 10 g carbohydrate (4 cal/g)

40 cal

How many calories in my red wine? USDA label

6 oz glass, (13% ABV)

190 cal

- 5.4 oz water

(0.78 oz alcohol, 22 g (7 cal/g)

154 cal)

- 4.6 g protein (4 cal/g)

18 cal

- 4.6 g carbohydrate (4 cal/g)

18 cal

How many calories are *really* in my red wine?

6 oz glass, (13% ABV)

66 cal

- 5.4 oz water

~~(0.78 oz alcohol, 22 g (7 cal/g) ————— **154 cal**)~~

(0.78 oz alcohol, 22 g (1.4 cal/g) **30 cal**)

- 4.6 g protein (4 cal/g) **18 cal**

- 4.6 g carbohydrate (4 cal/g) **18 cal**

Does beer make you fat?



**NO! Alcohol cannot be converted to fat.
It is against the laws of thermodynamics.**

Why does beer seem to make you fat? What do you eat when you drink...

Beer?

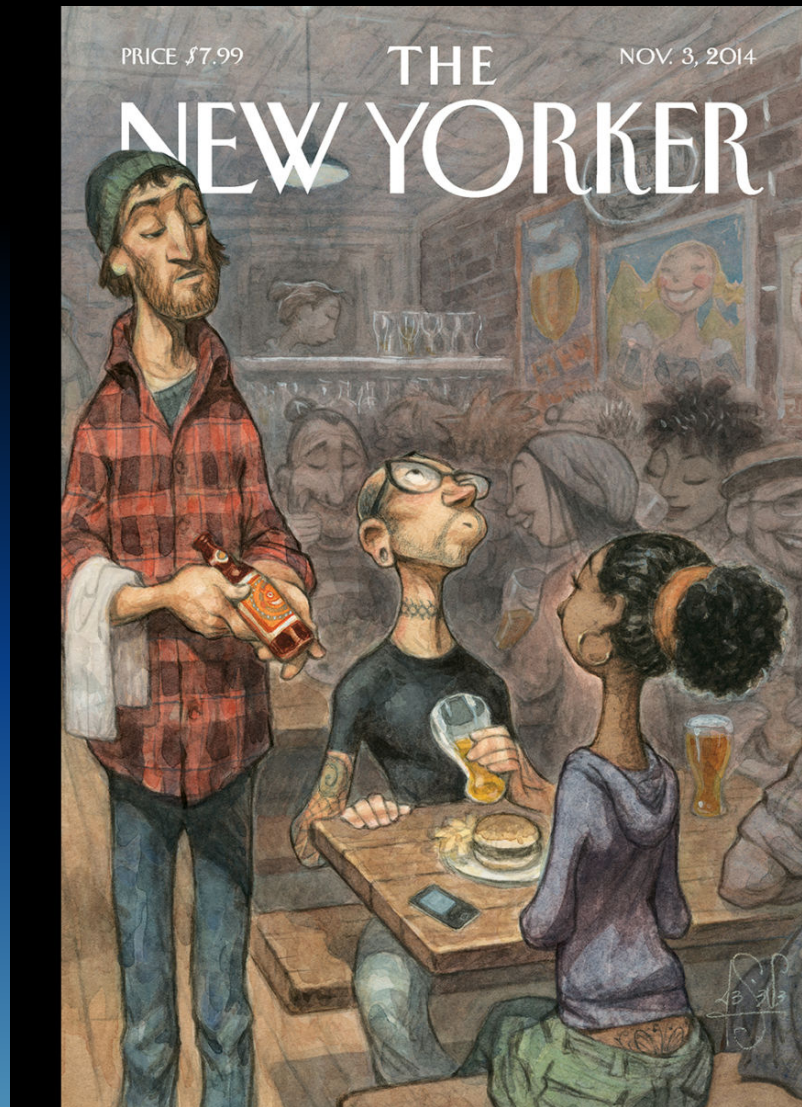
Wine ?



A man walks into a bar and orders....

- One 12 ounce *Guinness* (4% alcohol)
 - 126 calories – 76 alcohol calories = **50 calories**
- One 12 ounce Sam Adams *Boston Lager* (5% alcohol)
 - 180 calories – 95 alcohol calories = **94 calories**
- One 12 ounce *Coke* **142 calories**
- 1/2 dozen *Buffalo Wild Wings*, with sauce **640 calories**
- One medium *McDonalds fries* **380 calories**
- One order *Taco Bell Nachos Supreme* **450 calories**

Why is this beer drinker so skinny?



The French Paradox

- The French diet is loaded with fat, butter and cheese, yet France has a low rate of heart disease.
- *Sacre´bleu!* It must be the wine!
- Thus, wine is good for the heart

~ S. Renaud, Bordeaux Univ.,1991

Claimed it was resveratrol in the grape skins.



Effects on Heart Risk Factors

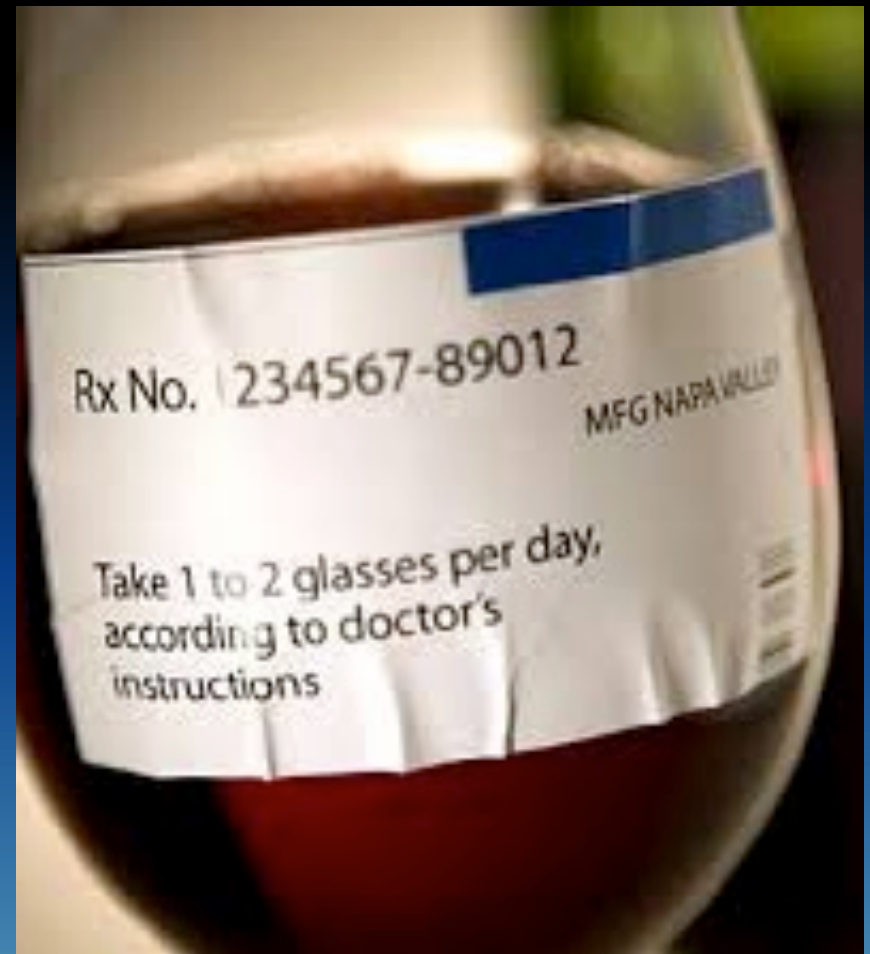
- Clinical tests show that it's the **alcohol**, not a trace chemical in wine, that transiently:
 - Improves lipid/cholesterol profile
 - Decreases inflammation
 - Lowers blood pressure
 - Improves glucose tolerance
 - Decreases platelet clotting
- Does the alcohol effect persist over time?

Studying the effects of alcohol on health



- Men are not mice! Cannot study in lab
- Must rely on *surveys*: lifestyle, diet, activity, drinks, health, medical records
- Many pitfalls
 - Self-reporting of amount consumed
 - Don't distinguish beverage type
 - Definition of “drink” is variable
 - Difficult to compare studies
- Flawed study design and interpretation

Lack of objectivity leads to study bias



Summary: alcohol and heart health

- “Low to Moderate” daily drinking decreases death from all heart causes, by 25 – 40%
- All sexes, ages and degree of heart health
- What is meant by “low to moderate” is not defined in most surveys. One definition:
 - 1-2 drinks for a man, 0-1 drinks for a woman
 - 15 g alcohol : 12 oz of 5% beer, 5 oz of wine, 1 ½ oz spirits
- What do doctors recommend?

What do doctors recommend?

- The American Heart Association **does not recommend starting to drink if you don't already**
- Your family doc may recommend a glass of wine per day—based on the urban myth of red wine (Apparently she never heard about beer).
- My suggestion? Balance personal risk factors, health benefit and lifestyle changes

WHAT'S BETTER: BEER OR WINE?



The down side of drink

- Intoxication
- Cirrhosis of the liver
- Hypertension
- Car accidents
- Dependence and addiction
- Withdrawal (DT's)
- Brain damage
- Cancer



Cancer and alcohol

- Alcohol is labeled a “carcinogen”
- 3% of all cancer deaths in US related to alcohol
- Almost all are due to cancers of the head and neck (voice box, mouth, throat, etc.) and esophagus
- Occur mostly in **heavy drinkers** who are also **smokers**
- Liver cancer increased in cirrhosis of the liver
- **What about the rest of us?**

Cancer risk and alcohol drinking

- Increased cancer risk in US, UK studies:
 - *Million women study in UK, ongoing since 1996*
 - *Nurses' Health Study (58,888 female nurses) since 1989*
 - *Health Professional Follow-Up Study (51,529 US men in health professions) since 1985*
- Data re-analyzed in 2015 to separate out smoking
- Cancer risk in men not increased with >2 drinks per day unless they are smokers
- Breast cancer risk in women was increased with low-moderate alcohol, but only 1.13 times over non-drinkers

Comparable cancer risk factors

- Smoking, 15 x – 30 x lung cancer
- Radon in home, 3 x – 4 x lung
- Obesity (60 lb+), 2 x breast cancer
- Living in a city, 1.32 x breast cancer
- Daily exercise, 0.9 x breast cancer (lowers risk)
- 20 gm fiber daily, 0.80 x colorectal (lowers risk)

What do doctors recommend?

- The National Cancer Institute recommends you don't need to stop alcohol because the effect is minimal (except for some)
- My suggestion?
- Modify lifestyle factors with the biggest impact: smoking, obesity, exercise
- Balance personal risk with alcohol decisions

The Elephant in the Room

Intoxication

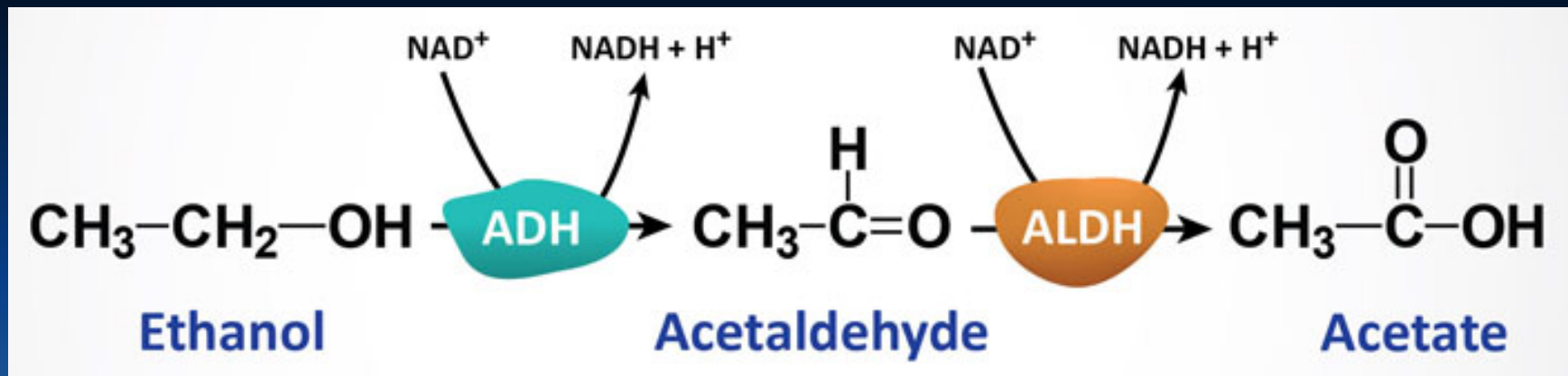


Stages of intoxication

BLOOD ACOHOL	INTOXICATION
0.01% - 0.10%	Euphoria (happiness, a “high”); slight loss of coordination and attention span
0.11% - 0.20%	Some loss of coordination and balance, poor attention, impaired judgment, slurred speech, mood swings
0.21% - 0.30%	Severe loss of coordination, incoherent thoughts, confusion, nausea and vomiting
0.31% - 0.40%	Drowsiness, memory lapse, loss of consciousness. Similar to surgical anesthesia
Over 0.40%	Severe alcohol poisoning, slowed or stopped breathing, coma and death

Degree of intoxication is related only to the BAC

Alcohol metabolism





It's not only how many, but it's how they go down

Your *maximum* BAC depends on amount of alcohol, your weight, speed of intake, and your level of ADH

Two ounces alcohol:

1. Rapid, immediate intravenous

220 lb man 0.054 BAC

110 lb woman 0.108 BAC **LEGALLY DRUNK**

2. Rapidly consumed (two 6% pints)

BAC 0.03 man, 0.06 woman

3. Slow, with food over 2-3 hours

BAC 0.01-0.02 man, 0.02-0.04 woman



HOW DO YOU KEEP B.A.C. LOW?



ALCOHOL IN

- Don't drink on an empty stomach
- Drink slowly, don't chug it
- Pace yourself
- Keep count, and consider the alcohol content



ALCOHOL OUT

- Increase your liver ADH over a few weeks by drinking more
- ADH levels vary naturally with female hormone levels (increase) and aging (decrease)
- There is no other way to speed up your alcohol metabolism

How can you sober up fast?

How can you sober up fast?

You can't!

Conclusions: beer and health

- We have been drinking beer since civilization began, and are adapted to it by nature and culture
- Beer is nutritious beverage. It is high in vitamins and minerals, while low in fat, salt, sugar and calories.
- The main ingredient in beer and wine is alcohol.
- The health effects of beer are due to the alcohol, rather than compounds present in small amounts

Conclusions: beer and health, continued

- Moderate, daily drinking has positive heart effects
- Alcohol increases cancer risk for some, especially smokers
- Excessive alcohol and intoxication is bad for your health
- You must individually weigh risks vs. benefits

What do I do?



- I drink 0-2 beers/day
- I am careful to drink in a way that keeps my BAC low
- I eat a high fiber diet with lots of vegetables, fish and dairy
- I exercise regularly
- I follow recommended health preventive measures

CHEERS! TO YOUR HEALTH!



DRINK RESPONSIBLY.

THANK YOU.