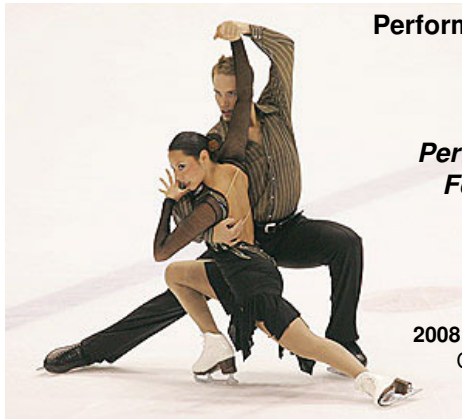




PROFESSIONAL **PSA** SKATERS ASSOCIATION



Performance vs. Appearance:

Keeping a Performance-Centered Focus on Nutrition

2008 Dance Coaches College
Colorado Springs, CO
April 25-26, 2008

“Bridging the Gaps” between the ART, SCIENCE and BUSINESS of coaching.



“Success in competition should be the outcome of quality training, not chance or luck. It should be planned for and thus expected.”

Do you know this athlete?

“I had no idea how to lose weight.

I was eating fat-laden, greasy dormitory food and I said ‘I cannot eat this, I will just have a salad.’

Meanwhile, I am training 20 hours a week.

I needed much more than a salad for dinner.

So that set me up for a binge at night. I would binge and purge. Used laxatives. Eventually diet pills.

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FACTS:

- Appearance is important.
- Nutrition affects performance.
- Food is the only fuel.
- Food should be fuel, not fear.
- Under-eating slows metabolism.
- Nutrition can be periodized.

MYTH:

Eating is bad.

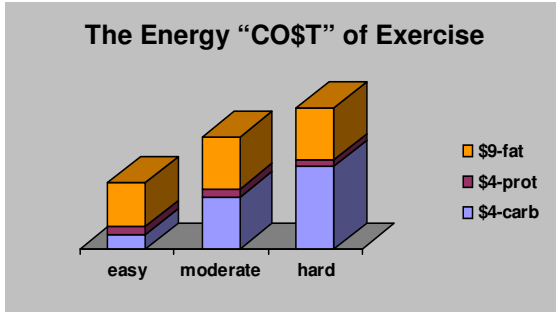
FACT: It doesn't matter how good you look if you can't perform.



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Everything we do is focused on performance...Why not nutrition?

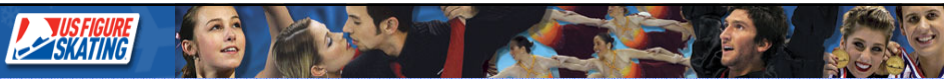
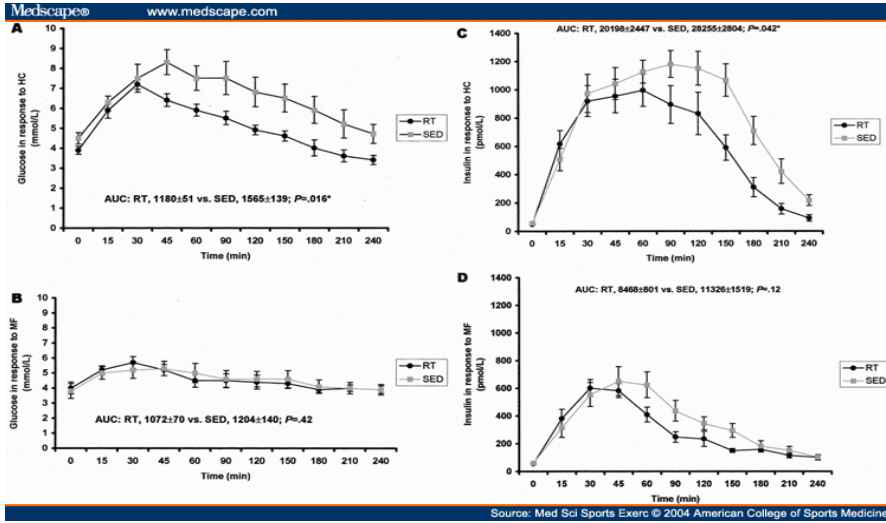
The Energy "CO\$" of Exercise





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What happens when we eat?



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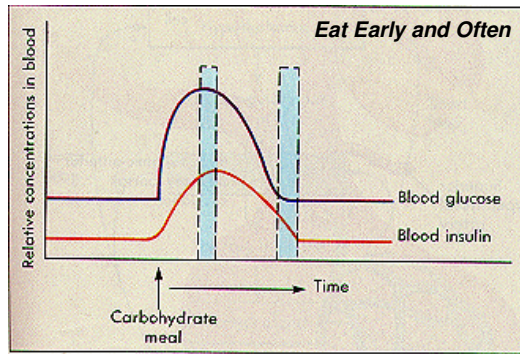
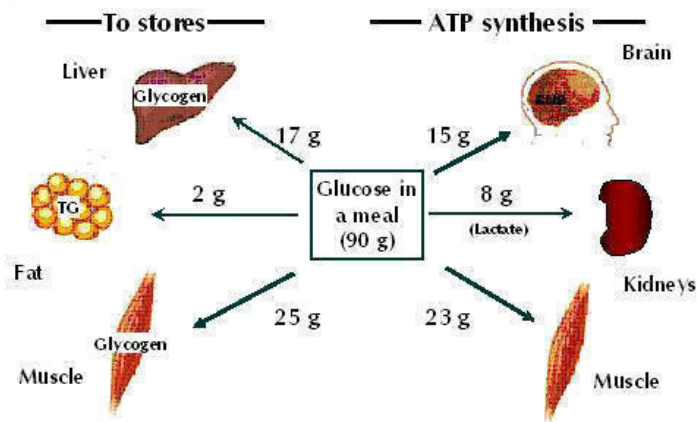


FIGURE 5-15
 Blood levels of glucose and insulin after a carbohydrate meal. Note that the peak of blood insulin is reached shortly after the peak of blood glucose, and that insulin levels remain elevated for some time after the glucose has returned to within the normal range. These are indications of the time lag in this feedback system.



- Smaller Mixed Meals (5-6 per day)
Insulin Steady
Preferable during day
- Large HC Meals (3 per day)
Insulin Spikes
OK post-workout

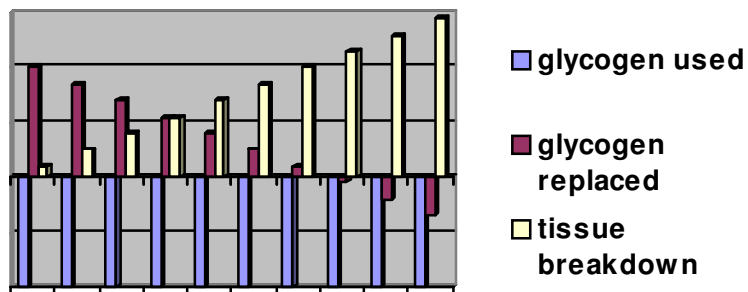
Distribution of glucose after a meal



There is a direct link between fatigue and muscle glycogen depletion.

There is a direct link between fatigue and muscle glycogen depletion.

Figure 2. Long-term failure to replace glycogen leads to tissue breakdown.



Over time, if the glycogen spent during one workout is not replenished prior to the next, the net effect is a reduction in the amount of glycogen available to fuel the tough routines. Should the intensity of the work remain too high for the body to rely on fat as the primary fuel source (which it will!), the body will turn to protein. Generally this translates into tissue breakdown or damage.

Although some tissue damage is normal with training, this series of events demonstrates the importance of replenishing glycogen stores after every workout.

Replenishing stores after every workout, not only maintains energy reserves from workout to workout, but also limits the amount of tissue damage per workout and over time.



A quality workout or practice relies upon the replenishment of fuel stores used/spent during previous sessions.

Challenges in the name of Appearance:

- Inadequate calories.
- Over-reliance on protein and fat.
- Under-reliance on carbohydrate.
- Substitutes (supplements, ergogenic aids).
- Poor recovery.
- Failure to practice eating/drinking.
- Failure to plan daily food intake.

The common eating pattern of aesthetic sport athletes is typified by infrequent meals with a heavy emphasis on a large end-of-day meal.

This is not useful for meeting athletic goals because it is guaranteed to create large energy deficits during the day.


These deficits cause low glycogen, muscle *catabolism* and *hyperinsulinemia*. Hyperinsulinemia encourages the manufacture of fat.

If caloric intake is inadequate, the body reduces the metabolic mass (ie muscle mass) to make a downward adjustment in the metabolic rate and the need for calories.

US FIGURE SKATING

There is a direct link between fatigue and muscle glycogen depletion.

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"After exercise, the dietary goal is to provide adequate energy and carbohydrates to replace muscle glycogen and to ensure rapid recovery. If an athlete is glycogen-depleted after exercise, a carbohydrate intake of 1.5 g/kg body weight during the first 30 min and again every 2h for 4 to 6h will be adequate to replace glycogen stores. Protein consumed after exercise will provide amino acids for the building and repair of muscle tissue. Therefore, athletes should consume a mixed meal providing carbohydrates, protein, and fat soon after a strenuous competition or training session."

(ACSM, ADA, Dietitians of Canada Joint Position Statement on Nutrition and Athletic Performance, 2000, p 2131)

US FIGURE SKATING

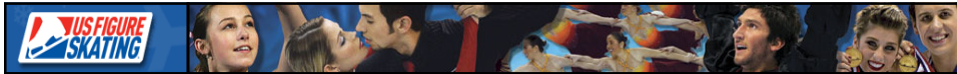
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Food Item	Amount	Carbohydrate (g)	Protein (g)	Ratio CHO:Prot	Fat (g)	Calories (Kcal)	Vit A (ugRE)	Vit C (mg)	Vit E (mg aTE)	Sodium (mg)	Potassium (mg)				
Solid Foods	Bagel w/ Peanut butter	1w/ 2 tbsp	49	16	3.1	17	399	0	0	3	558	345			
	Yogurt w/ Grapenuts	8oz w/ 1/2 cup	58	13	4.5	4	309	0	2	0	242	556			
	PBJ (w hite bread)	1 sandwich	44	12	3.7	18	375	0	1.5	3	415	287			
	PBJ (w heat bread)	1 sandwich	46	13	3.5	18	384	0	1.5	3.5	451	370			
	PowerBar (basic)	1 bar (65 g)	45	10	4.5	2	230	0	60	9	90	150			
	PowerBar Bites	1 bag (50 g)	32	8	4.0	5	200	0	54	9	190	160			
	Clif Bar (non-iced)	1 bar (68 g)	48	8	6.0	3.5	230	333	60	10	110	210			
Liquid Nutrition	Milk (2%)	8oz	12	8	1.5	5	122	0	2.4	0.2	122	376	Milk-based	lactose	casein
	Milk w/ Chocolate Syrup	8oz w/ 2 tbsp	24	9	2.7	5	172	0	2.4	0.2	170	407	Milk-based	lactose, sucrose	casein
	Carnation Instant Breakfast	1 can (10 fl oz)	37	12	3.1	2.5	220	450	30	2.5	230	610	Milk-based	lactose, sucrose	milk
	Boost	1 can (8 fl oz)	41	10	4.1	4	240	250	60	10	130	400	Lactose-free	sucrose,fructose	milk
	Ensure	1 can (8 fl oz)	40	9	4.4	6	250	250	30	2.5	200	370	Lactose-free	sucrose,fructose	soy.whey,milk
	SlimFast	1 can (11 fl oz)	40	10	4.0	3	220	350	60	10	220	600	Milk-based	sucrose,fructose	milk
Gatorade Nutrition Shake	1 can (11 fl oz)	54	20	2.7	8	370	?	?	?	280	560	?	??	??	

Vit A, Vit C, Vit E values based on 1997-1998 Dietary Reference Intakes (DRI) for Adult Males
(Vit A 1000 ug RE, Vit C 60 mg, Vit E 10 mg aTE)

Fat is almost exclusively used or stored in response to day-to-day fluctuations in energy balance.

Am J Physiol Endocrinol Metab, 1988

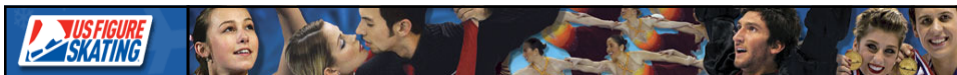
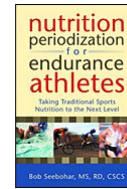


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Foods	Featured Nutrients				
	Carbohydrate	Protein	Antioxidants	Fiber	Other
1. Blueberries	✓		✓ Anthocyanins		
2. Blackberries	✓		✓ Anthocyanins		
3. Strawberries	✓		✓ Vitamin C		
4. Oranges	✓		✓ Vitamin C		Heperidin
5. Mango	✓		✓ Vitamin A, Vitamin C		
6. Broccoli		✓	✓ Vitamin A, Vitamin C	✓	Vitamin K
7. Carrots		✓	✓ Vitamin A, Vitamin C	✓	Vitamin K
8. Tomatoes		✓	✓ Vitamin A, Vitamin C	✓	Lycopene
9. Sweet Potatoes	✓		✓ Vitamin A (beta-carotene), Vitamin C		Potassium, Iron, Copper, Manganese
10. Avocado		✓	✓ Vitamin A	✓	Potassium, Folate, Iron, Manganese, Magnesium
11. Spinach		✓	✓ Vitamin A		Potassium, Folate, Iron, Manganese, Magnesium
12. Mixed Greens		✓	✓ Phytonutrients		
13. Potatoes	✓		✓ Vitamin C		Vitamin B6, Copper
14. Bananas	✓		✓ Vitamin C		Vitamin B6, Potassium
15. Almonds		✓	✓ Vitamin E (gamma-tocopherol)		
16. Cranberries	✓				Hippuric acid
17. Oatmeal	✓	✓		✓	Manganese
18. Granola	✓	✓		✓	Manganese
19. Olive Oil		✓	✓ Vitamin E		Oleic acid
20. Black beans	✓	✓		✓	Folate
21. Yogurt	✓	✓			Calcium, Phosphorus
22. Milk	✓	✓			Calcium
23. Orange juice	✓		✓ Vitamin C	✓	
24. Whole grain bread	✓	✓		✓	Manganese
25. Whole grain pasta	✓	✓		✓	Vitamin B
26. Eggs		✓			Vitamin K, Cholesterol, Lutein
27. Beef		✓			Iron, Zinc, Vitamin B12
28. Salmon		✓			Omega-3 fats
29. Shrimp		✓			Selenium, Vitamin D, Vitamin B12
30. Chicken		✓			Selenium, Niacin

The dynamics of energy and fluid intake should match the dynamics of energy and fluid usage.

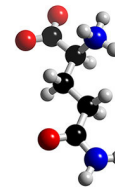
Dan Benardot



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Bottom Line: Carbohydrate is GOOD...

- Adequate carbohydrate intake maintains glycogen stores and therefore plasma/muscle *glutamine*. *Glutamine* is a fuel source for immune system cells.
- Adequate carbohydrate intake keeps glutamine levels higher during intense training and helps return levels to normal after exercise.
- Adequate carbohydrate intake also attenuates the cortisol response to exercise.
- Note: Carbohydrate during exercise is used to maintain blood sugar levels, not for glutamine synthesis.
- A diet low in carbohydrate *and* high in protein may create a condition of acidosis, which requires buffering with glutamine, reducing its availability and increasing susceptibility to infection.





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...Alcohol is BAD.

- Alcohol contains almost twice as many calories as juice (7 kcal/gram vs 4 kcal/gram).
- Alcohol causes disrupted and fragmented sleep, and consistently disrupts the proportions of the various sleep stages:
 - Suppression of REM sleep during the first half of the sleep period
 - "Rebound effect" after 4-5 hrs, longer-than-normal REM periods when alcohol has cleared from the body.
- Tolerance to alcohol's sedative and sleep-stage effects can develop within 3 nights.
- Alcohol before bedtime can suppress growth-hormone secretion at a dose-related rate.
- Alcohol-related suppression of growth-hormone secretion can persist over repeated nights of alcohol administration, despite sleep-stage tolerance.



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Also in the name
of appearance?

"I had no idea how to lose weight.

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and I said 'I cannot eat this, I will just have a
salad.'***

Meanwhile, I am training 20 hours a week.

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"As an athlete, you are often put on this pedestal because you are not supposed to have a problem. Here I was this Olympic champion struggling with this eating disorder that I cannot fix myself.

I had been through these incredibly tough workouts, and I had always taken pride in my mental toughness but I could not beat this thing. And every single time I would binge and purge, I would think that this is the last time. Never again. Then something would happen, I would have a rough day, not do well on an exam, not train well, not have a good race, and it would happen again.

We all know the cycle."

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Early Warning *Signs* of Disordered Eating

- Preoccupation with food; talks about food a lot
- Preoccupation with weight
- Dissatisfaction with body
- Skipping meals
- Repeated comments about "feeling fat"
- Severe food restriction
- Eating only "safe," "healthy," or "fat-free" foods
- Not eating around others
- Often cold or chilled (esp away from rink)
- Wearing baggy clothes
- Binging/purging
- Excessive exercise (i.e. additional exercises/workouts which are not part of the program)

**DISORDERED EATING:
RECOGNITION
AND
PREVENTION**

A Guide for Coaches

A Publication of U.S. Figure Skating



"I have never seen a patient who suffers from anorexia or bulimia who does not have a severe self-esteem problem."

It's not a nutrition problem.

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Poor nutrition can do this too!!

Glycogen Depletion?
Recovery, glycogen, carbohydrate

Immunosuppression?
Stress, cortisol, WBC, illness

Autonomic Nervous System Imbalance?
Involuntary homeostasis, sympa (accel), para (brake)

Central Fatigue?
Carbohydrate, BCAA, serotonin, sleepiness, lethargy, moodiness

Elevate Cytokines?
Stress, inflammation, ILs, CNS, adrenal, gonadal

Lactate

Weight

Sleep Quality

Appetite

Healing

Menstruation

Concentration

Self-Esteem

Performance

Rest/Rec HR

Fatigue

Soreness

Injury

Illness

Apathy

Lethargy

Fear of Comp

Moodiness

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Remember...

- > Education
- > Cohesiveness
- > Communication
- > Relationships

TRAINING-HEALTH-LIFESTYLE-ENVIRONMENT

Volume, intensity, recovery, taper, technique, competition, colds, fever, GI infection, menstrual dysfunction, sleep, daily schedule, nutrition, housing conditions, leisure activities, family, roommates, teammates, coach, job, school

- > Fitness
- > Technique
- > Nutrition
- > Psychology

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Fueling for Performance

w.r.t. Training.

- Eat foods that *support* daily training requirements in terms of total energy, fuel sources and metabolic catalysts.
- Cover the basics of variety, color, timing, carbs, protein, and fluids, and extend this to recovery.

w.r.t Recovery.

- Take advantage of the post-exercise insulin response to replenish glycogen, attenuate tissue breakdown and promote tissue accretion.
- 30-40 grams carb plus 10-20 grams protein within 20-30 min of workout; Followed by a mixed meal. Repeat snack after meal if tough session.



w.r.t. Cortisol.

- Insufficient carbohydrate can lead to elevated cortisol.
- 6-10 grams/kg body weight. 130 lbs: 354-590 grams; 190 lbs: 516-860 grams.

w.r.t. Physique.

- Balance calorie intake with training expenditures.
- Time calorie intake to maximize use and storage.
- Obtain calories from sources that enhance metabolism and minimize waste and unnecessary hormonal responses.

w.r.t. Mental stress.

- Address / overcome nutrition and food related challenges that can increase mental stress.



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"I am very relaxed and well-rested. I have great sensations and I am competition hungry."

-Eneko Llanos (Triathlon), 24 hours before winning the 2003 ITU Long-Distance World Championships



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