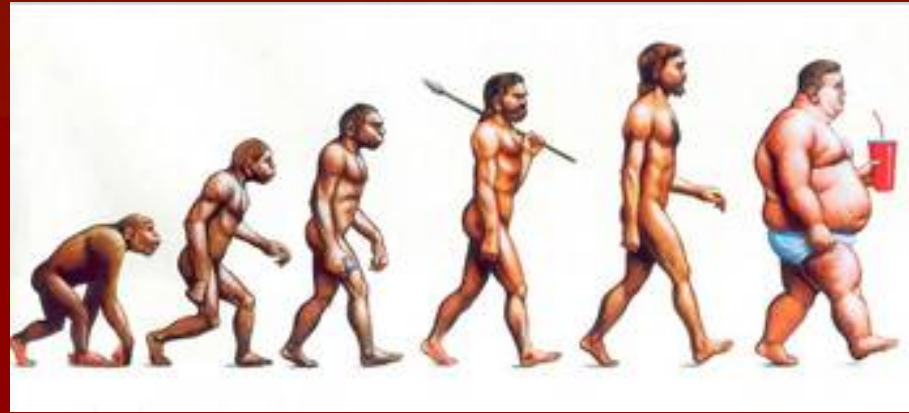


# Real World Fat Loss



**Destroying the Dogma**  
**-a practical guide for fitness trainers**

Alwyn Cosgrove

# Thank You

- MF Athletic/ Perform Better
- Team Results Fitness (and of course the founder and CEO – Rachel Cosgrove)
- All of you for spending your time and money to better yourselves and raise the standards of this profession.

'Don't give me the facts, give me the truth... the facts are always changing'

-- Alduous Huxley

- The information presented is my opinion based on over 17 years of coaching experience, communication with several professionals in my field and an incessant desire to better myself and improve the rate and magnitude of my clients results.
- I'm not here to argue my opinion versus your opinion.
- Please ask questions.  
I'll explain my views but am unlikely to change them.

# My Personal Information Filter...

- At this point there is so much information available – that you **NEED** to filter out as much as you take on board.
- My personal filter is to heavily prioritize information that comes from “Real World” Practitioners whose livelihood depends upon delivering results or solving problems (and I’m a fanatic for proof).
- Anyone can criticize a method – but only a few ever actually improve a method

**In 1990 - \$33 BILLION DOLLARS**  
**was spent on weight loss**

**By 2004 – the amount spent on weight loss PRODUCTS alone (not training, diets or surgery) was estimated to be**

**\$46.3 BILLION DOLLARS**

Current estimates suggest that in 2006 the US public will have spent a combined amount (products, training, diets and surgery) of \$100 BILLION Dollars on weight loss.



- “At any given time, approximately 45% of women and 30% of men in the United States are attempting to lose weight”

### **Effects of Low-Carbohydrate vs Low-Fat Diets on Weight Loss and Cardiovascular Risk Factors**

*Alain J. Nordmann, MD, MSc; Abigail Nordmann, BS; Matthias Briel, MD; Ulrich Keller, MD; William S. Yancy, Jr, MD, MSH; Bonnie J. Brehm, PhD; Heiner C. Bucher, MD, MPH*

- The number one reason for hiring a trainer is still .....

**WEIGHT LOSS**

**Yet.....**

- Less than 0.5% of the fitness industry is financially independent.
- Less than 5% of fitness coaches are making six figures.
- The fitness industry as a whole is NOT servicing the weight loss market effectively. The numbers don't lie.
- We need to STOP pretending that the methods that “MOST” trainers are using are worthwhile

# What this seminar will cover....

1. We will DESTROY the myths that surround this topic
2. We will demonstrate exactly what is wrong with traditional and popular fat loss programs
3. We will show exactly how to create a fast, effective fat loss training program.
4. All supported with scientific proof and real world examples.

*My Story....*

# A quick trip through history...

- 1970 – the videocassette was created
- 1976 – VHS format was developed
  
- 1995 – DVD was finalized
- 2006 – Hi-def DVD and Blu-Ray Discs were released
  
- 1998 – TiVo began public trials
- 2000 – DVR (TiVo) became widespread
- 2006 – DVR became commonplace (more than 55% of the US)

# Exercise History

- 1968 – Kenneth Cooper published “Aerobics”
- 1970 – Published “The New Aerobics”
- 1972 – Aerobics For Women
- 1977 – The Aerobics Way
- 1982 – The Aerobics Program for Total Well Being
- 1985 – Running without Fear
- 1988 – The New Aerobics for Women
- 1999 – Regaining the Power of your Youth at Any Age

# Aerobics for Health?

- 1987 – “People who followed my exercise guidelines exactly, but ignored their diet and their weight...had heart attacks at age 55”  
- K. Cooper
- “followed my exercise guidelines EXACTLY...”
- “ignored...their weight”... ?
- 1992 – “Research has shown that strenuous aerobic exercise is associated with oxidative stress and tissue damage”  
– K. Cooper



# Aerobics for Health?

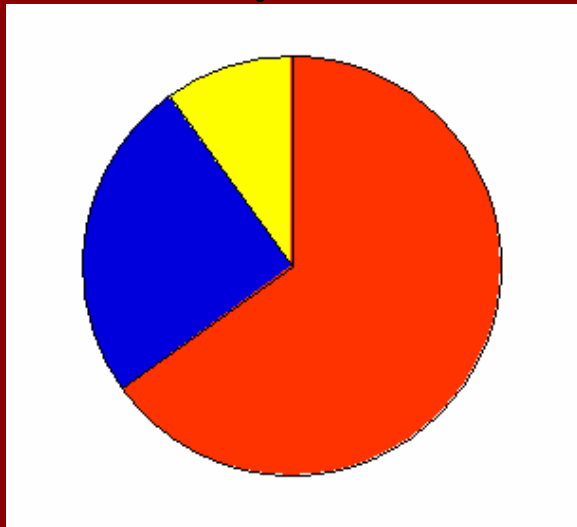
- 1992 – “the body’s need for oxygen during aerobic exercise seems to produce free radicals which can result in DNA damage, cancer, direct damage to muscle tissue and make the cells more susceptible to aging”  
- K. Cooper
- 2000 – “there is no correlation between aerobic endurance performance and health, longevity or heart disease protection”  
-K. Cooper

Why did we stop listening to Dr Cooper in 1968 ?

If we applied that same learning style to our television technology we would still be using Betamax cassette tapes.

# Energy expenditure

- Daily energy expenditure consists of three components: Resting metabolic rate (RMR – the sum of BMR plus basic living), diet-induced thermogenesis (DIT) and energy cost of physical activity



10% **Dietary induced**



20 - 30% **Activity induced**



60-70% **Resting Metabolic Rate**

# The HIERARCHY of Fat Loss ...

1. Correct Nutrition
2. See Number 1
3. Activities that burn calories, maintain/promote muscle mass and elevate metabolism
4. Activities that burn calories and elevate metabolism
5. Activities that burn calories but don't necessarily maintain muscle or elevate metabolism

# Five Factors for Fat Loss Training...

1. **Metabolic resistance training**
2. **High Intensity Anaerobic Interval training**
3. **High Intensity Aerobic Interval Training**
4. **Steady State High Intensity Aerobic Training**
5. **Steady State Low Intensity Aerobic Training**

- 
- If I have only 3 hours per week - only use # 1.
  - If I have 4-5 hours - use #1 and # 2
  - If I have 5-6 hours available - add # 3
  - If I have 6-8 hours available - add #4
  - If I have more than that – add # 5

# Effective Fat Loss Programming

Let's start with a question.....

How much do YOU know about Fat Loss?

■ Q: If we create a caloric deficit of “X” amount – we will lose “Y” amount of fat?

(i.e the caloric deficit = the fat loss, a 3500 calorie deficit = one pound of fat loss)

True or False?

**FALSE**



- In a study of meal frequency, it has been shown that a group eating 6 meals per day lost more fat than a group eating 2 meals per day – despite calories being equal.

Scand J Med Sci Sports. 1996 Oct;6(5):265-72.

Effects of meal frequency on body composition during weight control in boxers.

Iwao S, Mori K, Sato Y.

First Division of Health Promotion Science, Graduate School of Medicine, Nagoya University, Japan.

This study showed that irregular meal intake was associated with a lower thermic effect of feeding than a regular meal pattern (6 meals per day) despite total meals per week being the same.

*“The reduced TEF with the irregular meal frequency may lead to weight gain in the long term”.*

Farshchi HR, Taylor MA, Macdonald IA.

Decreased thermic effect of food after an irregular compared with a regular meal pattern in healthy lean women.

Int J Obes Relat Metab Disord. 2004 May;28(5):653-60.

- Q: A calorie is a calorie. With the same meal frequency, as long as we adjust the “calories in vs. calories out” we will see the same fat loss. (i.e. proteins, carbs and fat content doesn't really matter).

True or False?

**FALSE**

At the SAME caloric intake, a Low carbohydrate diet resulted in significantly greater fat loss (and participant retention) than a low fat diet.

Annals of Internal Medicine

A Low-Carbohydrate, Ketogenic Diet versus a Low-Fat Diet To Treat Obesity and Hyperlipidemia

William S. Yancy Jr., MD, MHS; Maren K. Olsen, PhD; John R. Guyton, MD; Ronna P. Bakst, RD; and Eric C. Westman, MD, MHS

2004 May 18;140(10):769-77.

## Other studies

### Isocaloric reduced carbohydrate (CHO) vs. higher carbohydrate investigations

<u>Reference</u>	<u>%CHO</u>	<u>%CHO</u>	<u>Wt. loss(kg) ± SEM</u>	
	<u>Low</u>	<u>High</u>	<u>Low CHO arm</u>	<u>High CHO arm</u>
Rabast et al (1978)	10	68	14.0 ± 1.4	9.8 ± 1.0
Rabast et al (1981)	12	70	12.5 ± 0.9	9.5 ± 0.7
Golay, Allaz et al (1996)	15	45	8.9 ± 0.6	7.5 ± 0.5
Golay, Eigenheer et al (1996)	25	45	10.2 ± 0.7	8.6 ± 0.8
Layman et al (2003)	44	59	7.5 ± 1.4	7.0 ± 1.4
Baba et al (1999)	25	68	8.3 ± 0.7	6.0 ± 0.6
Lean et al (1997)	35	58	6.8 ± 0.8	5.6 ± 0.8
Young et al (1971)	7	23	16.2 ± 0.9	11.9 ± 0.8
Greene et al (2003)	5	55	10.4 ± 2.1	7.7 ± 1.1
Brehm et al (2003)*			8.5 ± 1.0	3.9 ± 1.0
Brehm et al (2005)*			9.8 ± 0.7	6.1 ± 0.9
Volek et al (2004)*	10	60	8.0 ± 1.0	4.5 ± 1.0

\*: Reduced carb group actually consumed MORE calories than the high carb group

- Q: The addition of aerobic training to a caloric deficit (through diet) will increase calories burned and therefore increase fat lost.

True or False?

**FALSE**



### Three Month Study

The addition of 45 minutes of aerobic exercise at 78% Max Heart Rate 5 days a week for 12 weeks had **NO EFFECT** over dieting alone.

Int J Sport Nutr. 1998 Sep;8(3):213-22.

**Influence of diet and/or exercise on body composition and cardiorespiratory fitness in obese women.**

Utter AC, Nieman DC, Shannonhouse EM, Butterworth DE, Nieman CN

## Six Month Study

Two groups:

Diet Only

Diet plus aerobic exercise (50 mins, 5 days per week)

No additional effect of aerobic exercise on body composition

J Clin Endocrinol Metab. 2007 Jan 2

Effect of calorie restriction with or without exercise on body composition and fat distribution.

Redman et al

## Twelve Month Study

Six hours of aerobic training per week for one year.  
(60 mins per day, six days per week)

Average weight loss after one year was 3.5lbs or about  
0.3lbs per month

3.08lbs for women and 3.96lbs for men.

Obesity 2007 June - 15:1496-1512.

**Exercise Effect on Weight and Body Fat in Men and  
Women.**

McTiernan et al

- Q: If diet (total caloric and macronutrient intake) is a constant, then **the more calories you burn during training, the more fat you will lose..**

True or False?

**FALSE**

- 20 weeks endurance training vs 15 weeks Interval training
- Energy cost of endurance training = 28,661 calories. Interval Training = 13,614 calories (less than half)
- The interval training group showed a **NINE TIMES** greater loss in subcutaneous fat than the endurance group (when corrected for energy cost)

Tremblay A, Simoneau JA, Bouchard C.

Impact of exercise intensity on body fatness and skeletal muscle metabolism.

Metabolism. 1994 Jul;43(7):814-8.

- Q: You need a caloric deficit to lose fat, and a caloric surplus to gain muscle. Therefore it is impossible to do both at the same time.

True or False?

**FALSE**



Donnelly JE, Sharp T, Houmard J, Carlson MG, Hill JO,  
Whatley J,E, Israel RG

Muscle hypertrophy with large-scale weight loss and resistance training.

Am J Clin Nutr. 1993 Oct;58(4):561-5.

- This study put the participants on an 800 calorie per day liquid diet for 90 days.
- Average weight loss over the 90 day period was 35lbs
- All subjects increased the cross sectional area of their muscle fibers significantly.
- It appears that weight training can produce hypertrophy in skeletal muscle (and therefore increases in metabolism) even during severe energy restriction and large-scale weight loss.

Demling RH, DeSanti L.

Effect of a hypocaloric diet, increased protein intake and resistance training on lean mass gains and fat mass loss in overweight police officers.

Ann Nutr Metab. 2000;44(1):21-9.

- Three groups following a hypocaloric diet for 12 weeks.
  - Group one was a diet only group.
  - Group two was diet, plus resistance exercise plus whey supplement.
  - Group three was identical to group two although they used a casein protein supplement.
- 
- After 12 weeks the diet only group had a loss of 5.5lbs of fat with no change in lean mass. (5.5lbs total weight loss)
  - The resistance plus whey group had a total fat loss of 9.2lbs and a lean mass gain of 4.4lbs. (4.8 lbs total weight loss)
  - The resistance plus casein group showed a total fat loss of 15.4lbs and a lean muscle gain of 8.8lbs. (6.6lbs total weight loss)

- Q: There is nothing you can rub on your skin that can reduce your fat stores

True or False?

**FALSE**

Armanini D, Nacamulli D, Francini-Pesenti F, Battagin G,  
Ragazzi E, Fiore C.

Glycyrrhetic acid, the active principle of licorice, can reduce the thickness of subcutaneous thigh fat through topical application.

Steroids. 2005 Jul;70(8):538-42. Epub 2005 Apr 12.

- Treated one thigh with the glycyrrhetic acid cream, and the other with a placebo.
- After one month the difference was significant.

Caruso MK, Pekarovic S, Raum WJ, Greenway F.

## Topical fat reduction from the waist.

Diabetes Obes Metab. 2007 May;9(3):300-3.

- 2 groups – both groups exercised and ate 1200 cals per day for 12 weeks. One group applied an aminophylline cream to the midsection.
- The reduction in waist circumference was 11 +/- 1.0 cm in the aminophylline cream group and 5.0 +/- 0.6 cm in the control group

- Q: Is “Spot Reduction” through exercise possible?

■ YES



- Stallknecht B, Dela F, Helge

Are blood flow and lipolysis in subcutaneous adipose tissue influenced by contractions in adjacent muscles in humans?

Am J Physiol Endocrinol Metab. 2006 Sep 19;

Study showed blood flow and lipolysis are generally higher in subcutaneous tissue adjacent to contracting as opposed to resting muscle

Q: Are there any supplements (besides casein) that can enhance fat loss?

■ YES

Couet C, Delarue J, Ritz P, Antoine JM, Lamisse F.

Effect of dietary fish oil on body fat mass and basal fat oxidation in healthy adults.

Int J Obes Relat Metab Disord. 1997 Aug;21(8):637-43.

- Subjects were fed a control diet for three weeks
- Subsequently – the diet was changed – 6g of fat was replaced by 6g of fish oil (total calories remained unchanged)
- Fat oxidation increased and the subjects lost an average of 2lbs of fat in the following three week period.

Hill AM, Buckley JD, Murphy KJ, Howe PR.

Combining fish-oil supplements with regular exercise  
improves body composition

Am J Clin Nutr. 2007 May;85(5):1267-74.

- Study showed that fish oil at 6g per day (1.9g of omega 3) reduced body fat levels **INDEPENDENT** of exercise

# Dogma

Myths, BS and crappy recommendations

# Fasted aerobic training

Q: If steady state aerobic exercise barely works for fat loss anyway, why would it magically work better just because you haven't eaten in a while?

Q: Does substrate utilization during exercise have any effect whatsoever on total fat lost?

This has all come from the misunderstanding of the fat burning zone.

# Fat Burning Zone on Trial

Peak fat oxidation has been shown to occur during exercise at 63%  $\text{VO}_2$  max. This peak level got progressively less beyond that point, and was minimal at 82%  $\text{VO}_2$  max, near the lactate threshold of 87%

Achten J, Jeukendrup AE.

Relation between plasma lactate concentration and fat oxidation rates over a wide range of exercise intensities. *Int J Sports Med*.

2004 Jan;25(1):32-7.



# Misinterpreted....

- It has been widely misconstrued that a greater net amount of fat is burned through lower to moderate intensity work, regardless of study duration and endpoints assessed.
- There has been misinterpretation of TOTAL fat oxidation with proportional fat oxidation.
- The postexercise period has been overlooked. No distinction is ever made between during-exercise fat oxidation, recovery period fat oxidation, total fat oxidation by the end of a 24-hr period, and most importantly, a longer term of several weeks

## ...the underlying mistake...

Focusing on stored fuel usage during training instead of focusing on optimally partitioning exogenous fuel for maximal lipolytic effect around the clock.

In other words – burning fat during the  
OTHER 23 hours of the day.

- Research has repeatedly shown that carb ingestion **during** moderate-intensity (65-75% VO<sub>2</sub> max) **does not reduce fat oxidation** during the first 120 min of exercise

Coyle, et al..

Carbohydrates during prolonged strenuous exercise can delay fatigue.

J. Appl. Physiol. 59: 429-433, 1983.

- Coyle, et al.  
Muscle glycogen utilization during prolonged strenuous exercise when fed carbohydrate.  
J. Appl. Physiol.. 6:165-172, 1986

- This study examined the effect of a during-training solution of high-glycemic carbs on moderately trained men undergoing either low intensity exercise (25% VO<sub>2</sub> max) or high-moderate intensity (68% VO<sub>2</sub> max).
- Subjects completed a 2-hr cycling bout, and ingested the carbohydrate solution at 30, 60, and 90 minutes in.
- In the low-intensity treatment, fat oxidation was not reduced below fasted-state control group's levels until 80-90 min of exercise.
- In the 68% group, no difference in fat oxidation was seen whether subjects were fasted or fed throughout the trial.

Horowitz JF, et al.

Substrate metabolism when subjects are fed carbohydrate during exercise.

Am J Physiol. 1999 May;276(5 Pt 1):E828-35.

# Summary

- At moderate intensities (63-68% VO<sub>2</sub> max) carbs during exercise do not reduce fat oxidation for at least the first 80-120 minutes of continuous exercise.
- At the established intensity level of peak fat oxidation (~63% VO<sub>2</sub> max), carbohydrate increases performance without any suppression of fat oxidation.
- Carb Intake During Exercise = Increased Performance
- Increased Performance = More Work Performed
- More Work Performed = More Calories Burned

# So what does work...?

We know that

1. Increased meal frequency
2. A reduced carbohydrate diet, (low insulin?)
3. Interval training
4. Resistance training
5. And possibly casein, fish oil (omega 3) and CLA supplementation

... allows for the greatest amount of fat loss.

- Interval training works because it is metabolically demanding. It works via “metabolic disturbance”.
- How does resistance training work ?

Geliebter A, Maher MM, Gerace L, Gutin B, Heymsfield SB, Hashim SA.

Effects of strength or aerobic training on body composition, resting metabolic rate, and peak oxygen consumption in obese dieting subjects.

Am J Clin Nutr. 1997 Sep;66(3):557-63.

(Strength training group lost significantly more fat and maintained more muscle than an isoenergetic aerobic group)



Kramer, Volek et al.

Influence of exercise training on physiological and performance changes with weight loss in men.

Med. Sci. Sports Exerc., Vol. 31, No. 9, pp. 1320-1329, 1999.

Overweight Subjects were assigned to three groups:

Diet Only, Diet plus aerobics, Diet plus aerobics plus weights

- Diet group lost 14.6 lbs of fat in 12 weeks.
- Aerobic group lost only **one** more pound (15.6lb) than the diet group (training was 3 times a week starting at 30 mins and progressing to 50 minutes over the 12 weeks).
- The Weight Training group lost **21.1lbs of fat** (44% and 35% more than diet and aerobic only groups respectively).

Bryner RW, Ullrich IH, Sauers J, Donley D, Hornsby G, Kolar M, Yeater R.

Effects of resistance vs. aerobic training combined with an 800 calorie liquid diet on lean body mass and resting metabolic rate. J Am Coll Nutr. 1999 Apr;18(2):115-21.

- Aerobic group: 4 hours per week  
Resistance training group: 2-4 sets of 8-15 reps. 10 exercises, three times per week.
- V02 max **increased equally** in both groups.
- The resistance training group lost significantly more fat and did not lose **ANY LBM**, even at only 800 calories per day.
- The resistance training group actually **increased metabolism** compared to the aerobic group which decreased metabolism.

# Afterburn

- Effective fat loss programming hinges on the understanding of EPOC.
- EPOC (Excess Post-Exercise Oxygen Consumption) is defined scientifically as the “recovery of metabolic rate back to pre-exercise levels” and “can require several minutes for light exercise and several hours for hard intervals.”

Schuenke MD, Mikat RP, McBride JM.

Effect of an acute period of resistance exercise on excess post-exercise oxygen consumption: implications for body mass management.

Eur J Appl Physiol. 2002 Mar;86(5):411-7. Epub 2002 Jan 29.

This study used a circuit training protocol of 3 exercises for 4 sets of 10 reps each (12 total sets) in 31 mins.

EPOC was elevated significantly for 38 hours post workout

# Putting it all together

- The only truly limited, non-renewable resource you have is :

**TIME**

# Therefore we have to have a HIERARCHY...

1. Correct Nutrition
2. See Number 1
3. Activities that burn calories, maintain/promote muscle mass and elevate metabolism
4. Activities that burn calories and elevate metabolism
5. Activities that burn calories but don't necessarily maintain muscle or elevate metabolism

# So for training...

1. **Metabolic resistance training**
2. **Interval based high intensity Anaerobic cardio training**
3. **Interval Based high intensity Aerobic Training**
4. **Steady State High Intensity Aerobic Training**
5. **Steady State Low Intensity Aerobic Training**

- 
- If I have only 3 hours per week - only use # 1.
  - If I have 4-5 hours - use #1 and # 2
  - If I have 5-6 hours available - add # 3
  - If I have 6-8 hours available - add #4
  - If I have more than that – add # 5

# Putting it all together..

- Maximize the benefits of your resistance training program by creating maximal metabolic disturbance.
- Characterized by:
  - Heavy resistance
  - Time under tension approaching 60s
  - Short/incomplete rest periods
  - The use of alternating sets/mini-circuits to maximize work density



## For example..

A1:	Squats	2-3	x	8-12 reps	60s rest
A2:	Push ups	2-3	x	8-12 reps	60s rest

If each set takes approximately one minute, the lower body and upper body both get approximately 3 minutes between sets. This allows you to use very heavy weights.

However, the actual rest is only 60 seconds.

By pairing upper and lower body in an alternating fashion we can drastically increase total work done, and therefore total calories burned.

This in turn increases the EPOC significantly

- A sequence of 4-8 exercises performed 3-4 times per week in superset, tri-set or circuit fashion, with 2-3 interval cardio sessions (either post workout or on separate days) has repeatedly been shown in our facility to be the most effective fat loss training program.
- Combined with a reduced refined-carbohydrate diet, this plan can easily result in 1-3lbs of fat loss per week.

Thank you

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