

BETWEEN THE LINES

Sharing knowledge and experience about coaching and training

Cycling

Sandra Yaworski January 25, 2018 Nutrition, Running, Cycling, OCR

Female Athlete Hydration and Fueling - Review of the Book ROAR

Sandra Yaworski January 25, 2018 Nutrition, Running, Cycling, OCR

I have been reading the book ROAR by Dr. Stacy Sims. It is an amazing read and geared specifically to women. I am on my second time through. There is just so much good information, and how the book is structured takes some time to understand. The book was recommended in a course I took that highlighted some new thoughts on hydration and nutrition. To be honest, it took a bit to get my head around the **difference between absorption and fueling**. It is a concept that most nutritionists do not differentiate between (at least to my knowledge). Sims drives home the saying, **“food in your pocket and hydration in your bottle.”** Sims does an amazing job of explaining how the female body works. She dives deep into how hormones impact the female athlete during the menstrual cycle, pre-and post menopause and pregnancy. She provides prescriptive guidelines on hydration and fueling to help the female athlete throughout the different stages of her hormonal journey. I do not provide information on fueling and hydration in this article as it is very in depth. I encourage you to read the book.

As a former elite female athlete, I understand the struggles that female athletes are challenged with when it comes to hormones and performance. When I competed, the literature and research available specific to the female was limited. Much like Sims, I was frustrated with coaches suggesting to get on the pill to control my menstrual cycle. It did not make sense to me given how the pill can elevate estrogen and progesterone.

As a coach, I have finally found a resource that can help me better coach my female athletes in areas of hydration and fueling for training and racing. The concepts of fueling and hydration that Sims provide are not foreign. What Sims does extremely well is **connecting the dots between the female hormonal cycle and what has to change in hydration and fueling during training and racing.**

My goal for this article is to summarize some of the key points from the book. Every female athlete and coach of females should read this book. I don't recall much of my high school biology class (except that my teacher sat at the back of the class and picked his nose) but Sims refreshes this for us.

Human Biology Refresher

- The largest muscle fibers in a female body are endurance fibers (Type 1).
- Essential body fat for females is 12 percent and for 4 percent for males.
- Females pump out 30 percent less oxygenated blood than males.
- Males have 6 percent more red blood cells and 10 to 15 percent more hemoglobin (molecule that carries oxygen in red blood cells).
- Female VO2 is 15 to 25 percent lower than men.

- It takes longer for females to sweat and this impacts heat tolerance.
- Females rely more on fat whereas males rely more on carbs. This is important to understand when it comes to the menstrual cycle and pre-and post menopause. Understanding the shifts in estrogen and progesterone levels and how to manage this is the main theme in the book.
- Females are more likely to sweat out excess sodium and eat into their muscles for energy.
- The metabolism of a female drops back to normal within three hours post exercise compared 21 hours for a male.

Key Concepts From the Book

- Performance levels are highest once your period starts and days five to 11 following your period (Follicular phase). Estrogen levels surge on day 12.
- Five days before menstruation, estrogen and progesterone reach peak levels (Luteal phase). Why is this important to know? Estrogen reduces carbohydrate burning ability so when estrogen surges it will have an impact on high intensity performance. Female athletes will feel unfit and unable to push hard. High levels of progesterone promotes catabolism. It increases the breakdown of muscle tissue and makes it more difficult to access amino acids. Key message here is that one-third of muscle tissue is composed of the amino acids leucine, isoleucine and valine. Leucine triggers muscle repair and growth.
- Estrogen and progesterone are elevated during the luteal phase (days 14 to 28 of the cycle), and peak five days before menstruation. During this time blood plasma can drop up to 8 percent. This can impact hydration and cooling during exercise. Plasma volume is the amount of fluid in our blood. When it is low our blood is thicker, less blood is pumped out, and exercise will feel harder. Progesterone elevates core temperature, and this means higher loss of sodium.
- From ages 35 to 50 estrogen declines by 35 to 50 percent and progesterone by 75 percent. In addition, there is relatively higher estrogen levels compared to progesterone.
- Wake up call – postmenopausal females have a hard time metabolizing fructose in processed foods (for example, gels). Further, synthesis of protein changes and there is a higher rate of protein breakdown. Also, sweat rate is lower, and the ability to feel thirst declines. There is also a decreased insulin sensitivity. Insulin instructs the body what to do with blood glucose. Insulin communicates to our cells to take up blood glucose to use as fuel or store as glycogen. Decreased insulin sensitivity results in higher amounts of glucose left in circulation and eventually stored as fat.

Read the book

This book is a handbook for female athletes and coaches of female athletes. The book teaches you about the female body and provides exact details on hydration and fueling during exercise and through the different stages of the female hormonal phases.

My Own Advice

To maintain and improve bone density and lean muscle, heavy resistance training is needed. I felt that even though the book does go into exercises and some strength training, it does not stress the need for **heavy resistance training**. My suggestion around types of exercises are centered around things we need to be able to do in our everyday life. We need to be able to **lift, carry, pull and push**. In addition, **everything we do requires grip strength**. Throw away the biceps curls and start working on functional exercises which focus on the **anterior and posterior chain**. I also suggest adding **exercises that help with balance**, and this should be part of every routine regardless of age.

- Deadlifts
- Farmer's Carries
- Sled push and pull
- Standing or walking with a sandbag on your shoulders
- Squats with weight
- Walking Lunges with weight
- Push ups
- Pull ups and body holds

Tagged: nutrition, female nutrition, female athletic nutrition



Training systems

Sandra Yaworski October 2, 2017 Running, Cycling, OCR

Understanding the relationship between the intensity of a training session and its optimal duration is poorly understood. Endurance athletes derive energy from three different energy systems. This means that an endurance athlete needs to train all three.

Muscles are fuelled by different energy systems. The systems are:

- The creatine phosphate system
- The lactate system
- The aerobic system

When we train we want to target these energy systems in a way that reflects the demand of the the event we are training for.




Simplified, the three training zones are:

- Zone 1- aerobic, easy, recovery, long slow distance. I can keep going and going. Heart rate is under 80% but better around 70-75% of maximum. Energy system used is aerobic system.
- Zone 2 - Threshold training. Moderately hard. Heart rate is 80-85% of maximum. Energy system is aerobic system with use from the lactate system.
- Zone 3 - Very high intensity, race pace. Training is very hard. Heart rate is over 85% of maximum. Energy system used is lactate with use from the creatine phosphate system.

Knowing when and how to train these systems based on the event we are training for is when improvement in performance is made. In addition, it is important to understand how much time is spent training in these zones based on the distance of event we are training for.

Tagged: training



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Sandra Yaworski October 2, 2017 Cycling, Running, OCR

Tips on choosing a coach

Sandra Yaworski October 2, 2017 Cycling, Running, OCR

Looking for a running coach? Here are some tips:

1. Certifications. Look for a coach who has National Coaching Certifications from National Governing bodies at greater than the first level.
2. Experience both in length and breadth. A coach who has been coaching for several years will have been exposed to lots of different athletes and will have learned what is needed for different levels of athletes with varying training years. In addition, a coach who coaches track, cross country, road and trail in all distances brings a lot to the table.
3. INTERVIEW COACHES and ask:
How they structure training? How often can you contact them? How would they approach helping you reach your goals? Do they plan your race schedule or does the athlete have the reigns on this?
4. Ask to meet current athletes. I always encourage new folks to come out for a couple of practices, if they are local to my area.
5. Ask for the names of a couple of athletes they have coached in the past, and also a couple from who they currently coach. Make connection with these athletes and ask for their view on the coach.

6. Look for results. A coach who has a reputation for improving performance of athletes is only part of an equation. The other part of the equation is the length of time athletes have been with a coach. A good coach has the ability to keep athletes accountable and responsible. In other words, they ensure that the athlete understands that training is a process of learning and adapting. It is not the same thing over and over again. A good coach knows when and how to move the training process along so that the athlete makes strides every year.

7. Make sure that the price that a coach charges is justifiable. The experience level must match the price being asked. Look for someone who is a professional and not a hobbyist. There are a lot of online coaches with pretty websites; however, that does not mean that they have adequate experience coaching. Do your homework by going through #1 to #6.

8. Experience as an athlete adds to the toolbox a coach has but it is not experience as a coach. A good coach was mentored by other coaches. Ask the person who their mentors were. I had some amazing mentors both as an athlete and a coach. I owe a lot to those people.

Tagged: Marathon Racing, Coaching



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Sandra Yaworski March 8, 2017 Cycling, Food, OCR, Running

Weighing in with Whey Protein

Sandra Yaworski March 8, 2017 Cycling, Food, OCR, Running

Lately, I have been asked questions around post exercise recovery nutrition and nutrition for getting lean and for weight maintenance. I am going to discuss whey protein and its benefits.

What is Whey Protein

Most of us grew up on drinking milk. Milk is comprised of two types of proteins - 80% casein and 20% whey proteins. Whey is the liquid by-product of milk that separates during the manufacturing process. Following pasteurisation, the whey clumps and is extracted.

Whey protein can be way too confusing. If you walked into a sport supplement store you would notice that, there are many whey protein products. Here is a summary that provides the highlights:

1. Whey protein concentrate consists of around 80% protein. It contains naturally occurring carbohydrates and fats. This make it a calorie dense supplement (i.e. contains high levels of calories per serving). It contains some lactose.
2. Whey protein isolate consists of 85% to 95% protein. This type of whey has undergone further purification to minimize the macronutrients (see side bar) and enhance the protein content. As such, it has less lactose and fat. This process removes micronutrients (see side bar) and subfractions (see side bar) that aid in boosting our immune system.

Side bar for those of you who missed out nutrition courses in high school and hated math and biology:

There are three macronutrients required by humans: carbohydrates (sugar), lipids (fats), and proteins. Each of these macronutrients provides energy in the form of calories. For example:

- *In carbohydrates, there are 4 calories per gram*
- *In proteins, there are 4 calories per gram*
- *In lipids, there are 9 calories per gram*

Micronutrients are vitamins and minerals.

Subfractions are smaller amino acids and peptides.

3. Whey protein hydrolysate can be a concentrate or an isolate in which some of chemical bonds in the whey have been broken after being exposed to heat, acids or enzymes. This process allows for the whey to be absorbed more rapidly in the stomach compared to the other whey proteins. It causes a 28 to 43% greater spike in insulin levels than isolate.

Benefits of Whey Protein

There are numerous studies which have found that whey protein maximizes lean body mass and fat free mass gain. It also has been proven to improve upper and lower body strength. Here are the benefits of whey protein:

- As a recovery drink, it is rapidly digested and absorbed.
- It contains the amino acid leucine which is responsible for muscle building.
- It aids in body fat reduction or weight management while at the same time conserves or increases muscle mass. Power to weight ratio improvements are the result.

What is the right amount of Whey Protein?

- 20g of whey protein is the magic number.
 - For high volumes of training 20g of whey protein and 40g to 60g of carbohydrates. This helps recovery by replenishing muscle glycogen.
-

BIG and IMPORTANT Side bar

Glycolysis is the breakdown of carbohydrates. It lasts from roughly ten seconds into physical activity up to about two to three minutes. The energy for glycolysis comes from glucose, or our stored form of glucose called glycogen. Glycogen is stored in muscle tissue and the liver. The average person holds about 1,500-2,000 calories of stored glycogen. The liver contains about 100g of stored glycogen and muscle tissue contains about 400g of stored glycogen.

The liver is responsible for controlling blood sugar between meals. Our muscles main responsibility is to move bones. This allows us to do all the locomotive tasks associated with daily living.

Glycolysis is an anaerobic metabolic pathway. Carbohydrates are the only macronutrient that can be synthesized into usable ATP under anaerobic conditions. We need to make sure we take in enough carbohydrates to fuel glycolysis during activity and to keep our glycogen stores full. A reduction in muscle glycogen is associated with fatigue.

What is my recovery routine?

I personally use a combination of:

- Whey Protein Isolate (I use ON Gold Standard). A serving size provides 24g protein, 3g of carbohydrates 1g of fat and 120 calories.
- Skratch Recovery Mix. A serving size provides 36g carbohydrates, 7g protein, 3.5g of fat and 200 calories.

Within 90 minutes of this, I consume a meal or snack which is also a combination of carbohydrates and protein. If for some reason a meal is not possible within the 90 minutes, I consume another of the same mixture described.

If I am trying to reduce my weight or get lean, I will use a hydrolysed whey protein with less carbohydrates. I will shoot for 20g protein and 20g carbohydrates.

Micellar Casein Protein and Recovery

This article was about whey protein, but don't discount the value of micellar casein protein. The video does an amazing job of describing muscle protein synthesis (MPS) and muscle protein breakdown (MPB). For athletes, pre-sleep protein is essential. Ingesting micellar casein protein one to two hours before sleep is beneficial for recovery. The dosage recommended is 50g. Watch the video.

I have read a lot of different articles on casein, and to be honest, as a supplement there are several differing opinions. Grade and processing is a big factor. I think I will stick to whole casein as found in raw milk, milk protein concentrate and aged cheese.

Tagged: nutrition, recovery, eating for performance



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Sandra Yaworski January 22, 2017 Cycling, Running, OCR

Heavy Load Resistance Training for Endurance Athletes

Sandra Yaworski January 22, 2017 Cycling, Running, OCR

Endurance athletes have commonly followed the approach of endurance based resistance training. This involves performing high repetitions and sets in resistance training. However, in recent years this view has changed. Heavy load resistance training (HLRT) has become more of the norm. HLRT involves using low repetition numbers with a moderate set numbers. Loads are usually more than 80% of your one repetition maximum.

I decided to look at this logically and attempt to explain it in more simple terms. Let's start by looking at the muscle fiber types and their characteristics to help explain why HLRT is beneficial to endurance athletes.

Characteristics of Muscle Fiber Types:

Type I Slow Twitch (ST) – slow contraction time, small motor neuron, high resistance to fatigue, low force production, high mitochondrial density, high capillary density, high oxidative density. Used in aerobic activities.

Type II A Fat Twitch (FT-A) – fast contraction time, large motor neuron, intermediate resistance to fatigue, high force production, high mitochondrial density, intermediate capillary density, high oxidative density. Used in long term anaerobic.

Type II B Fat Twitch (FT-B) – very fast contraction time, very large motor neuron, low resistance to fatigue, very high force production, low mitochondrial density, low capillary density, low oxidative density. Used in short term anaerobic.

Muscle fiber composition in the body is genetically determined. However, numerous studies have proven that both the structure and metabolic capacity of individual muscle fibers can adapt to different types of training.

When we look at muscle recruitment in exercise, slow twitch muscles are recruited first. This is regardless of the intensity. As intensity level increases, recruitment of fibers is slow twitch first, then fast twitch A and lastly fast twitch B. When we apply different types of training methods we are effectively trying to recruit certain muscle fibers types or to get certain muscle fiber types to take on characteristics of other muscle fibers types.

For example, we could train FT-B fibers to take on some of the endurance characteristics of FT-A fibers. This is how HLRT comes into play. HLRT results in the body being able to recruit FT-B fibers as if they are FT-A fibers. We are trying to make the muscle fiber stronger, more resistant to fatigue, and have greater mitochondrial and oxidative density. Totally logical.

Of course, there are other benefits to HLRT. HLRT, like plyometric training, increases leg stiffness which improves performance economy. HLRT also stimulates neuromuscular efficiency and builds more power.




Summary

A muscle which is stronger is going to be more resilient and fatigue resistant, and have better overall performance economy. In endurance sports, performance economy is key. If an athlete can use less effort at faster speeds, they undoubtedly become a faster athlete. Totally makes sense to me.

The type of exercises that I recommend for endurance based athletes includes dead lifts, squats (different variations), steps ups, and lunges. Like a properly mapped out endurance plan, a strength program needs to follow a periodization structure to reap the biggest benefits.

Tagged: Strength Training



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Sandra Yaworski May 30, 2016 Running, Cycling

Keeping your female menstrual cycle healthy while training hard

Sandra Yaworski May 30, 2016 Running, Cycling

Written by Meaghan McCollum.

Meaghan is a naturopathic doctor practicing in Bridgeland, Calgary. She helps people achieve hormonal balance naturally in all stages of life and activity levels. As a avid runner herself she thoroughly enjoys working with endurance athletes. She owns a integrative naturopathic clinic and retail store called Naturmend. Check her out at: <https://www.naturmend.com/>

Endurance exercise has long been known to disrupt the natural female hormonal cycle. Around 1/4 of all female runners experience frank menstrual cycle disorders (1). And as many as 78% of regularly menstruating female runners (elite and recreational) experience disruptions to ovulation in at least 1 out of 3 cycles. (1). That's a lot of us.

What exactly are disruptions to the menstrual cycle? Any of the following can occur with greater frequency in athletes:

- Luteal phase deficiency (disrupted / shortened 2nd half of menstrual cycle)
- Anovulation (not ovulating leading to infertility)
- Oligomenorrhea (getting periods less frequently such as every 40-90 days)
- Amenorrhea (not getting a period at all)
- Menorrhagia (Excessive bleeding)

- PMS (no need to explain this one) & PMDD (extreme PMS)

These can be inconvenient, unpleasant symptoms yet also point to disruptions in the healthy balance of hormones. These imbalances can have long term health implications, and in the immediate future can also lead to decreased athletic performance (2,3). All good reasons to pay attention to these signs and work to achieve a better balance.

Fat is important for hormonal balance. We now understand fat tissue to be an important hormone contributor in the body. Two hormones called leptin and adiponectin are produced and released by fat tissue. When there is a rapid decrease in body weight and fat, leptin drops and adiponectin increases. The result of these shifts can affect female hormone release and prevent ovulation (4,5). Both of these effects are instigated by rapid weight loss, emphasizing the importance of gradual weight loss in athletes and maintaining appropriate body weight.

Some women once they drop below a certain body fat percentage may experience disruptions in their cycle even if the weight loss was gradual. Although dropping below a certain body fat percentage was a popular theory in menstrual disturbances in athletes, it is not true for every woman and is very dependent on individual requirements for body fat.

Stress and cortisol

Cortisol is a stress hormone that is released during exercise particularly longer duration and higher intensity exercise. Cortisol can also impact the female menstrual cycle by suppressing upstream hormone release from the brain (6). Managing cortisol levels during training and non-training times could reduce the overall load of cortisol on the hormonal system. This is also pertinent to emotional stress which results in greater cortisol levels as well.

Progesterone and estrogen are essential for your monthly rhythm

Progesterone and estrogen are hormones important in the normal functioning of the female menstrual cycle. Both are affected by intensive and prolonged exercise and are typically suppressed with chronic exercise (7). This of course has implications on the proper functioning of the menstrual cycle. Additionally estrogen plays an important role in preventing excessive muscle damage following endurance exercise (estrogen study)

What can you do to keep your female hormones cycling regularly and healthfully?

- **When trying to achieve a lower weight, take a slow and steady weight loss approach** This is to prevent the hormones leptin from dropping and adiponectin from increasing, which are connected to the proper function of your menstrual cycle. **Eat enough food** to power your training.
- **Increase exercise intensity in a slow and steady approach** (a.k.a: listening to your coach).
- **When under significant emotional stress consider cutting back** on intensity and/or volume of training. This will not only function to keep your cycle on track, but also help to prevent injury.
- **Practice good nutrition pre, during and post workouts.** This helps to keep cortisol release to a minimum by regulating blood sugar.
- **Balance the stress of intensive exercise with calming activities** such as gentle yoga, meditation, artwork or other calm activities that spark joy for you.
- **If you've done everything above and are still experiencing troubles with your cycle:** Consider investigating herbal treatment to help support your body toward hormonal balance while also supporting athletic performance.

Although running and other intensive endurance activity is associated with disturbances in the female menstrual cycle, you can still train hard and keep your monthly rhythm healthy. For some it takes a bit more effort, care and strategy surrounding diet, supplementation and rest. The benefit is worth it: better long term hormonal outcomes along with improved athletic performance and minimal PMS.

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Tagged: training, female cycle



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Sandra Yaworski January 2, 2016 Cycling

Cycling Power Meters and what data to look at

Sandra Yaworski January 2, 2016 Cycling

Cycling power data explained. What are data points you need to know as a cyclist.

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Sandra Yaworski October 12, 2015 Cycling

Cycling, testing, wattage and body weight

Sandra Yaworski October 12, 2015 Cycling

The best way is to use a power meter and periodically perform tests at different distances.

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We are a Canadian based company located in Calgary, Alberta. We provide custom running, duathlon, triathlon, OCR and cycling fitness plans.

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Endurance running, sprinting, jogging—running in all its forms requires energy, strength, and stamina. Osmo provides the hydration runners need to fight fatigue and cramping, along with nutrition that repairs sore muscles and speeds recovery. How To Handle Running In A Heatwave. Heatwaves seem to be occurring more and more frequently, and some have a great lack of experience in dealing with these occurrences. Our first tip... The Ten Best Running Books. Be inspired and pick up some valuable insight with these top running reads. Even the most obsessed runners can only spend at most a few... Pro Tom E Typical everyday speeds. When people walk, run, or travel in a car, their speed changes. They may speed up, slow down or pause for traffic. The speed at which a person can walk, run or cycle depends on many factors including: age. terrain. fitness. distance travelled. Some typical values for speed include: Method of travel. Follow these handy nutrition tips for new runners to improve both your speed and stamina. Running as a form of sport and exercise has very particular nutritional requirements. To get the best in performance, endurance and recovery out of your body, you will need to be concentrating on not only what you eat but when you eat. Follow these nutrition tips for new runners to improve both your speed and stamina. Healthy Eating. It goes without saying that once you start running your body will need extra fuel for those miles. You will be burning an extra 100 calories roughly for each mile that you run. Not only that, your muscles will be needing extra protein to keep them operating effici Do you want to improve your endurance? Knowing what to eat before and after a workout is essential if you want to run well. ✓ This overview will show you what a great runner's diet could look like. ...before a run. What you eat before a workout can have a positive influence on your running performance, but it can also really slow you down. Avoid foods that are high in fiber and fat before your run. They are harder to digest and can upset your stomach. Plus, you should wait about three hours after having a large meal (focus on carbs and protein) before working out. Can cycling help with running? Cycling is a great way to cross-train, whether you are healthy or working through an injury. Cycling is non-impact but has several aerobic benefits. You can do several workouts on the bike like riding uphill in a big gear to build strength. Another option is doing short sprints out of the saddle to spike your heart-rate and build speed. Lastly, you can also go for a longer, steady ride to build endurance. The biggest difference between cycling and running is there is less impact with cycling, so you can recover quicker from the sessions. [Download the All Out Stu