Women and Weight Training

by Tessa Yannone

Optimize strength training workouts for women to account for differences in musculature and hormones.

Every day, more women are moving from the cardio room to the weight room. It's a welcome transition; getting stronger can transform their self-esteem, confidence and self-efficacy. Supporting females strength-training ambitions is fundamental to their long-term success. Women and girls enjoy a wealth of benefits from resistance exercise.
To name a few:

- reduced injury risk
- better cardiovascular health
- stronger bones
- protection against diabetes
- less inflammation

As more women flock to strength training, for starters, the research on weight training for women is relatively new, and there are fewer studies on women than there are on men. Also, the physiological differences between genders is either misrepresented or not discussed.

We aren't that much different. In equally trained men and women, research finds most strength differences result from differences in muscle size, not gender (Bishop, Cureton & Collins 1987). These findings suggest that a man and a woman with the same muscle size should display the same amount of strength. Thus, we can retire terms like "toned" and "girl pushups"—and the pictures of pink dumbbells—because women should and can do the same exercises your male clients do. You, of course, already know this.
You should consider two crucial points, however:

- Women and men have different muscular fiber type compositions, making women less prone to fatigue (Hunter 2014).
- Female sex hormones, especially those involved in the menstrual cycle, can affect program timing and recovery (Sung et al. 2014).

Understanding these differences is pivotal in training that will help females achieve muscle growth, strength gains and training success.

Fiber Types in Women vs. Men

Type I and Type II Fibers

Generally speaking, the skeletal muscles of men are larger than those of women, and, in men, some muscles possess “a greater proportional area of metabolically and functionally faster muscle fibers,” whereas in women there is “a greater proportional area of the ‘slow’ type I fibers” (Hunter 2014). The higher concentration of type I fibers makes women more resistant to muscle fatigue. Men have a higher glycolytic capacity based on their larger concentration of type II fibers, priming males for quick, explosive activities like sprinting and weightlifting.
While muscle fiber type plays a large role, it is important to remember that the tendency to fatigue depends a lot on task conditions, including the following:

- contraction type, speed and intensity
- the muscle group involved
- environmental conditions
- state of arousal

(Hunter 2014)

Metabolism in Women vs. Men

The makeup of muscular tissue affects the energy substrates that each gender uses. Women typically carry 6%–12% more fat than men. Women are also better at handling fat and using it for energy during exercise, which spares muscle glycogen and decreases exertion ratings—again, playing into fatigue resistance. Additionally, women are more sensitive to insulin across the entire body and are better able to take up glucose (Lundsgaard & Kiens 2014).

For Women

Women are probably more resistant to fatigue than a male would be. Training sets in the 6- to 10-rep range seems to yield maximal increases in strength.
Because women can theoretically handle more work, the general-population of women may benefit from harder-intensity training sessions with supersets and timed rest periods. Consider pushing beyond comfort zone to achieve muscle development.

Sex Hormone Differences

Menstrual Cycle

Women's menstrual hormones fluctuate throughout their cycle, which usually lasts 28 days (hormonal contraceptives and other issues can alter the cycle). Hormonal fluctuations play a huge role in strength training, a reality only recently discussed in academic literature. Opening up this, you can tap into strengths a little more and use biology in favor (Sung et al. 2014).
The menstrual cycle has four phases:

- menstrual (days 1–5)
- follicular (days 1–13)
- ovulation (day 14)
- luteal (days 15–28)

The **luteal phase** triggers sharp hormonal changes—progesterone peaks and then plunges, along with estradiol. Hunger increases, moods change suddenly, core temperature rises, and more calories are burned; in fact, basal metabolic rate has been shown to increase by as much as 9% (Webb 1986). In this phase, symptoms of premenstrual syndrome often discourage interest in going to the gym.
The **follicular phase,** by contrast, is the time for women to really push themselves in hard workouts because estrogen hits its peak at this time, improving mood, energy and strength.

Estrogen vs. Testosterone

These sex hormones have the most impact on the relative strength of women and men. Men have much more testosterone, affecting their baseline strength. Thus, men start out stronger with higher absolute strength, but relative strength gains are about the same for both genders.
Estrogen, on the other hand, has proved to have some anabolic and protective effects against various injuries and diseases. Within muscle, estrogen has been shown to influence contractions and postexercise muscle damage by acting as an antioxidant and a stabilizing membrane and by binding to estrogen receptors (Enns & Tidius 2010). Estrogen also has regenerative properties, which is why combining exercise and hormonal therapies can increase lean tissue mass (Velders & Diel 2013).

Do Men and Women Respond Differently to Strength Training?
SEX SPECIFICITY AND GENE EXPRESSION
We know that men and women have different quantities of muscle fiber types: Women carry more type I, and men carry more type II, but it is also worth noting how men and women react to resistance training—specifically how their muscles react to the demands—as it relates to gene expression.
When at rest, women's muscles have a greater transcript abundance of genes involved in fatty acid oxidation and—because of this—females exhibit faster restoration after strength training, whereas males experience more prolonged changes and take longer to recover. Sex specificity, as it relates to gene expression, is suggestive of several signaling pathways and explains the disproportional muscle growth in males as compared with females. Sex differences therefore exist in skeletal muscle both at rest and following a bout of exercise (Liu et al. 2010).

DEVELOPING A LEAN FIRM BODY WITH THE HELP OF PROTEIN

Women and Protein – Why Getting Enough is Essential

Everyone, from babies to seniors, men and women, need to consume enough protein. Compared to men, though, women are more likely to be consuming a less-than-optimal amount. Make sure you and your female clients know just how important protein is in the diet. It does much more than build big muscles.

Protein Builds Lean Muscle Mass

Bodybuilders love protein, but don't make the mistake of thinking eating an adequate amount of protein will bulk you up like a heavy lifter. They get those big, bulky muscles from protein *and* a lot of hard work.

Protein is an essential component of muscles, but the protein you eat will mostly go to work strengthening the muscle mass you already have. Protein in the diet builds lean muscle, the kind of muscle that gives women the bodies many of them crave: slender, tight, and lean.

Protein is Essential for Weight Management

Trying to lose or maintain weight are common goals for your female clients. Protein is a crucial part of the diet for so many reasons, but especially for women trying to lose weight. Protein keeps you full and satisfied for a longer period of time than carbohydrates because they take longer to digest.

High protein amounts at breakfast can be particularly useful. It helps to minimize cravings for snacks later in the day and helps you avoid the dreaded hangry mood.

A Healthy Immune System

Being sick is no fun, and to stay healthy the immune system needs to function properly. This requires protein. Antibodies, key components of the immune system, are proteins. Avoiding the next cold going around feels great but also helps you stick with your workouts.

Supporting Bones, Hair, and Nails

Protein is structural. It provides the basic material for connective tissue, bones, hair, and nails. For women, bone health and density is important, especially as we age. Getting enough protein can keep bones strong and minimize the density loss that comes with aging. It also keeps hair and nails looking healthy and strong.

Signs You’re Not Eating Enough Protein

Not all women need to count grams of protein. If your client has very specific fitness goals, or really struggles to balance macros or lose weight, counting can be useful. For the rest of us it may just take greater awareness to realize if we’re not getting enough protein:

- Feeling unusually fatigued or weak
- Moodiness
- Brittle or damaged hair and nails, flaky skin
- Being hungry a lot of the time
- Getting sick a lot or staying sick longer than expected
- Slow healing of wounds
- Edema, swollen feet or hands

Check out this post on the ISSA blog about protein myths to learn more about this important macronutrient and why it's hard to get too much.

How Much Protein Do Women Really Need?

If you simply follow the government's Recommended Daily Allowance, or RDA, for protein intake you'll fall short. The RDA protein intake amount—just 0.8 grams per kilogram of bodyweight, or around 48 grams per day for a typical woman—is just 10 percent of daily calories. With this plan most of your calories would come from carbs and fat. Technically, it's enough for anyone who is sedentary, but it's far from ideal.

Most people go over the RDA, and the average American consumes about 16 percent of daily calories in the form of protein. (1) According to the Protein Summit Report, 16 percent of daily calories from protein is not too much, and in general Americans eat too little protein. (2) The Report states that at least doubling the RDA is recommended and safe.

Women and Protein – Counting Grams

One way to make sure you are getting enough protein is to count the grams in everything you eat. Different sources have different recommendations, but generally 0.8 grams of protein per kilogram of body weight is the minimum. For women who are active or trying to lose weight, more is better.

A good general guideline is 1.2 to 2.0 grams of protein per kilogram of body weight.

For a woman who weighs 150 pounds this means eating between 80 and 136 grams of protein per day. The high end of this range is pretty extreme and only really necessary for any client doing a lot of strength training, preparing for fitness competitions, or who is a serious athlete. Experts recommend you don't stay in that upper level indefinitely.

Balancing Protein with Fat and Carbs

You may also want to consider counting your protein by balancing macros. Measuring protein as a percentage of your calorie intake is worthwhile. Eating the right amount of protein is about more than just protein. Macronutrients don't exist separately; they interact with each other in the body. Getting the right balance is important for health and for hitting fitness and weight loss goals.

One way to determine the right balance of macronutrients is to look at body type. The percentages given here refer to the ratio of calories coming from a particular macronutrient:

- **Ectomorph.** This body type is naturally thin because of a relatively high metabolic rate. Ectomorphs should aim for a ratio of 25 percent protein, 55 percent carbohydrates, and 20 percent fat.
- **Endomorph.** Endomorph body type is naturally heavier with a slower metabolism. These clients should eat a ratio closer to 35 percent protein, 25 percent carbohydrates, and 40 percent fat.
- **Mesomorph.** A mesomorph has an athletic body and builds muscle fairly easily. A ratio of 30 percent protein, 40 percent carbs, and 30 percent fat is ideal.

Keep in mind that not everyone fits neatly into one body type category. But this is a good place to start for your client who wants to consider all her macros. She can start with the guidelines for the body type she is closest to and adjust as needed for weight loss or maintenance or for muscle building.

Protein Before and After a Workout

Another important consideration is how to eat before and after exercise. A quick search of this topic will bring up a lot of conflicting answers as to what, how much, and when you should eat before and after working out. Generally it's a good idea to have a good mix of protein and carbs a couple of hours before exercise so that you have the energy to do it.

After a workout, many experts suggest you should consume protein within a certain window of time. Again, there is debate and conflicting evidence as to how long the window is and how important it is to get some protein during it. A good rule of thumb is to **consume between 0.4 and 0.5 grams of protein per kilogram of bodyweight within a couple of hours of a training session**.

Because the evidence from research is mixed, don't get too bent out of shape trying to figure out specifics of eating protein after a workout. What is clear is that the overall protein you consume in a day is more important to muscle and fitness gains than timing protein consumption.

How Much Protein is Dangerous?

Yes, it is possible to eat too much protein. There is a dangerous level. The liver and the kidneys will suffer if you eat more than they can handle. The liver breaks down and makes new proteins. The kidneys process proteins as part of waste disposal and urine production.

The most protein that these organs can handle is about 3.5 to 4.5 grams per kilogram of weight. This translates to 238 to 306 grams of protein in a day for a 150-pound woman. While the kidneys and liver can technically process this much, it stresses the organs and can cause harm and damage. Eating this much is strongly discouraged.

Some signs of eating too much protein include constipation or diarrhea, dehydration, bad breath, and weight gain. Potential risks to health include kidney and liver damage, and even loss of calcium, which can negatively impact bone strength.

It's always important to talk to your clients about existing health issues before recommending diet plans. Anyone with kidney problems, past or present, may need to eat less protein than healthy individuals, and be sure they've checked in with their doctor.

How to Choose Foods with Protein

When choosing foods for protein, it is important to consider amino acids. There are nine essential amino acids that we need to eat because our bodies cannot make them from other molecules. All animal sources of protein provide these essential components. Plant proteins are mostly not complete, but they can be combined to include all nine.

For women looking to eat a healthy diet and to consume adequate protein, variety is important. If you get protein from a lot of different types of food, you'll hit all the bases and get all the essential amino acids. Some foods that are particularly high in protein, with all essential amino acids, include: (3)

- Three ounces of skinless chicken – 28 grams
- Three ounces of steak – 26 grams
- Three ounces of turkey – 25 grams
- Three ounces of tuna or salmon – 22 grams
- Three ounces of shrimp – 20 grams
- Six ounces of Greek yogurt – 18 grams
- Four ounces of one percent fat cottage cheese – 14 grams
- One ounce of soy nuts – 12 grams

These are high-protein foods, but nearly all foods have protein. Just one fist-sized serving of broccoli, for instance, has three grams of protein. A one-ounce serving of nuts or seeds has between four and seven grams of protein. Include a variety of meat, poultry, fish, dairy, and plant-based foods to meet your protein needs.

For Vegans and Vegetarians

Vegetarians can get all the essential amino acids from dairy and eggs, but vegans must meet protein needs entirely from plants. This is possible but requires a little more thought. A good general rule for getting all the essential amino acids is to balance intake of legumes, like beans, lentils, and peas, with whole grains. Together, these plant based foods provide complete proteins. Variety is especially important for plant-based eaters.

What About Protein Powders and Supplements?

Another way to get protein is through supplements, although whole foods should always be the main source of nutrients in a healthy diet. Supplements are just that, meant to supplement a diet. Your client may benefit from supplements if she struggles to get enough protein for various reasons: limited time to cook, not motivated to cook, or a vegan diet.

Some protein supplements you can recommend include whey or casein powders or pea, hemp, or rice protein powders for vegans. There are also more specialized supplements, like branched-chain amino acids for clients trying to restrict calories or meet very specific training goals.

Protein can be a confusing topic for your clients, especially women because most research and discussion is geared to men. Help your female clients by providing this important information about how, when, what, and how much protein to eat for health, weight maintenance, and strength and fitness.