Introduction

There are many aspects of successful sports performance. You need to train hard, practice hard, be focused when watching film, and have a good game plan. One important aspect that is often over-looked or not given its appropriate due is nutrition. What you put into your body is just as important, if not more important, than all you do in the weight room and on the practice field. There is an old saying, “You Cannot Out-Train a Poor Diet.” If you consistently put junk food into your body then you will be sluggish and more injury prone on the field. This manual is intended as a general guide to help you make better decisions. I know you face challenges like a busy class, practice/game, and training schedule along with limited hours and options at the dining hall. However, we are not looking for perfect, merely better. This manual is broken into the following sections:

1. Energy Needs
2. Macro Nutrients
3. Hydration
4. Body Composition – Gaining/Losing Weight
5. Game Day Nutrition
6. Supplements
7. Putting it all Together

The big key is to try not to make too many changes at once. Pick out one thing that you can do better today and focus on that for 2 – 3 weeks. Then pick another thing. That is how we successfully change habits.
Energy Needs

For college athletes, meeting energy needs can be a challenge. By Energy Needs, I am merely talking about the number of calories you require to compete at a high level. Many athletes fail to meet their energy needs on a consistent basis putting them at greater risk of injury and decreased performance. There are many factors involved when trying to determine energy needs. Gender, Age, Height, Weight, Activity Level (changes per sport and whether you are in-season vs out-of-season) all are important factors. What follows is a quick and dirty way of determining your energy needs:

- Gain Weight (Muscle!)
  - Body Weight x 15
- Maintain Weight
  - Body Weight x 12
- Lose Weight (Lose Fat)
  - Body Weight x 10

So for a 200lb athlete who wants to gain weight that athlete will need to take in 3000 calories/day. For a 120lb athlete who wants to maintain that weight that athlete will need to take in approximately 1500 calories.

Here are some tips for meeting your daily energy needs:

- Calculate your calorie needs
- Eat frequently throughout the day
  - Determine when you can eat!
- Carry snacks with you
- Choose energy dense foods
- Add milk to meals (if you need more calories)

On the following page is a not even close to comprehensive example of what an ideal plate would look like. Even with dining hall limitations this plate can absolutely be accomplished three times per day. For now focus on the quality of food on this plate. We will get further into adjustments based on male and female athletes along with Game Day nutrition later in this manual.
Action Steps:

1. Determine Your Energy Needs
2. Plan your eating schedule based on classes, training, practice, games
Macro Nutrients

A Macro Nutrient is one that gives the body energy. The Macro Nutrients are:

1. Carbohydrates
2. Proteins
3. Fats

The body needs a combination of all to perform properly. We will get into these individually.

**Carbohydrates**

Carbohydrates are the body’s primary source of energy. The brain uses carbohydrates exclusively. Your muscles are fueled by carbs (sadly, not Dunkin’s.) While the other macro nutrients do provide the body with energy we are not nearly as efficient converting those to energy. We are very efficient converting carbs to energy.

**Carbohydrates provide 4 calories per gram.**

High quality sources of carbohydrates are:

- Veggies
- Fruits
- Grains
- Beans
- Dairy

Each of these have unique benefits making variety the big key. Veggies, Fruits, and Whole Grains should make up the majority of your carbohydrate intake.

So, Carbs are important. Now, how much of your diet should consist of carbs?

**The general guideline is 2.7 – 4.5 grams per pound of body weight.**

Therefore a 175lb athlete will need 470 – 790 grams of carbohydrates for optimal performance. Yes, that’s a wide range. The range will give you a good idea of where you should be based on your sport and whether you are in-season or out of season. Energy requirements will be greater for sports like soccer, basketball, hockey, or lacrosse. Energy requirements will be less for baseball, golf, or softball. Athletes will also have greater energy needs when they are in-season as opposed to out of season.

In this section we have covered how to prepare your daily meals to meet your carbohydrate needs but what about carbs pre-, during, and post activity?

**Pre – 1 – 2 hours prior to activity, should be higher in carbs, lower in protein and fats. This is a great time for a pre-activity shake.**
**During** – While shorter bouts (< 1 hour) do not require special fueling strategies (water is more than sufficient), longer bouts do. This is where sipping on a sports drink can be beneficial. Halftime fruit or a snack bar can also help during longer, higher intensity games.

**Post** – 0.5 – 0.7 grams per pound of body weight + some protein. Replenishing glycogen stores is the primary focus here. Therefore carbs should be “simple” carbs.

### Action Steps:

1. **Focus on Quality and Variety of Carbs.** The majority of your carbohydrates should be Veggies, Fruits, and Whole Grains
2. **Determine your ideal carbohydrate intake based on your sport and whether you are in-season vs out of season.**

---

**Protein**

In the last section we learned that the primary role of Carbohydrates is to provide the body with fuel. While protein does provide the body with energy it is NOT an efficient source of energy.

**The primary role of Protein is to build and maintain muscle mass.**

Protein also helps with the feeling of fullness (satiety) and can help with fat loss. Protein is made up of Amino Acids. There are 20 Amino Acids, 9 of which are “Essential”. An “Essential” nutrient is one that the body requires but does not produce on its own; it must come from the foods we eat. You may have heard the term “Complete Protein.” A “Complete Protein” is one that includes all 9 Essential Amino Acids. We want to opt for Complete Proteins as much as possible. Examples include:

- Cottage Cheese
- Greek Yogurt
- Beef, Turkey, Fish, Chicken, Eggs, Pork
- Beef Jerky
- Protein Powder

Getting the appropriate amount of protein in the diet is not that difficult. What can be difficult is spreading out protein intake to take best advantage of their muscle building qualities.
The average athlete’s protein intake looks like the chart below:

Athletes will generally get about 12.4 grams of protein for breakfast, 25.8 grams for lunch, then a whopping 34.9 grams for dinner.

There has been a ton of research performed on optimal protein dose for muscle protein synthesis. The range that researchers keep coming up with is 20 – 30 grams. Our bodies simply can’t use more than that at a time and we get rid of it as waste. The following foods and quantities will provide the body with 20 grams of protein:

- 1 cup cottage cheese
- 1 cup Greek yogurt
- 4 ounces of beef, chicken, turkey, or fish
- 2 whole eggs + 3 egg whites (or 3 – 4 whole eggs)
- 1 ounce of beef jerky
- 1 can of tuna or salmon
- 1 scoop of protein powder
This is a good depiction of what our current dietary habits look like and what our optimal habits should look like:

After successfully spreading out your protein intake throughout the day, the other consideration is post-training protein intake. We learned in the Carbohydrates section that the majority of your post-training meal should consist of carbs, with protein making up a small portion of this meal. Optimal ideas would include:

- 1 – 2 cups of low fat chocolate milk
- 1 cup of Greek yogurt with fruit
- Cottage Cheese with fruit
- “Energy Bar”
- Apple with peanut butter

These are solid and inexpensive ideas to help you fuel your body and maximize muscle protein synthesis after training.

**Action Steps:**

1. Get equal amounts of protein during all your meals, aiming for 20 – 30 grams at each meal.
Fats

First, let’s dispel a couple big myths. Fats DO NOT make you fat. Nor do they contribute to heart disease. Ok, so that’s out of the way.

Fats are a vital source of energy and they can help fight inflammation, help with recovery, and improve overall health. They improve brain function and contribute to growth and development. There is also a growing body of research that suggests fats can protect us from concussions (more on that one later.)

Despite their importance to health and performance, most people are significantly lacking in healthy fats in the diet. The following is a consensus statement from the 2012 Global Summit on Nutrition, Health, and Human Behavior:

“Brain and Heart disorders resulting from LC-Omega-3 (EPA & DHA) deficiency are the biggest challenges to the future of humanity”

The above statement focuses on Omega-3 fats, and that is exactly what we will focus on in our eating habits. These fats are found primarily in cold-water fish like cod, herring, tuna, sardines, anchovies, and salmon. They can also be found in plant-based sources like flaxseed oils, some vegetable oils, and some leafy vegetables. However, our bodies do not convert plant-based sources to EPA & DHA well at all. As a source of fiber plant-based sources are great, however, as a source of healthy fats we can do much better. The following is a list of great sources of healthy fats:

- Olive Oil
- Canola Oil
- Avocado
- Nuts, Nut Butters, and Seeds
- Egg Yolk
- Dairy
- Fish and Fish Oil
- Visible Fat on Meats

This is not a comprehensive list but definitely represents a great starting point.

After determining high quality sources of fats then it becomes important to focus on the proper quantity. A good rule of thumb is fats should take up 20% - 35% of total calorie intake. Keep in mind that while carbohydrates and protein provide approximately 4 calories per gram, fats provide 9 calories per gram.

Back to the part about Omega-3 fats and their role in concussion prevention. There is a growing body of research that supports the idea that including the appropriate intake of Omega-3 fats in the diet can help prevent concussions and/or significantly speed up the recovery after a brain
injury. While this research is admittedly in its infancy, it is definitely encouraging, and yet another important reason to focus on high quality fats in your diet.

Omega-3 long-chain fatty acids and their use in traumatic brain injury and concussions

We don't yet have a randomized, placebo-controlled, clinical trial of omega-3s for either severe TBI or concussions. But we do know that omega-3s are the nutritional foundation of the brain and the neuronal cell wall...

And we know from growing amounts of clinical experience, that omega-3s can be immensely useful to decrease or eliminate many of the symptoms that plague patients following brain injury.

Action Steps:

- Focus on high quality Mono-unsaturated Fats and Omega-3 Fats.
- Examples include nuts, seeds, nut butters, egg yolk, fish, dairy, and visible fat on meats

Macro-Nutrients – Putting it all on a Plate

You have just gotten through a ton of great information and hopefully have 1 – 2 good action steps that you will be able to implement today. However, there has to be a way to simplify all this information that will eliminate the counting and measuring. The next two pages include a simple guide to calorie counting using only your hand. The first page is for men, the second for women. Use this guide for a quick and easy, and virtually fool-proof, guide to calorie control.
Calorie Control: A Simple Guide

FOR MEN

Calorie counting is often complicated, tedious, and inaccurate. So, at Precision Nutrition, we've come up with an easier way to control calories. No weigh-scales or measuring cups. No calculators or smart phones. Just the ability to count to two.

And your hand. To build your meals:

- 2 palms of protein dense foods with each meal
- 2 fists of vegetables with each meal
- 2 cupped handfuls of carb dense foods with most meals
- 2 entire thumbs of fat dense foods with most meals

Note: Your hand size is related to your body size, making it an excellent portable and personalized way to measure and track food intake.

Also note: Just like any other form of nutrition planning, this guide serves as a starting point. Stay flexible and adjust your portions based on hunger, fullness, and other important goals.
Calorie Control: A Simple Guide

FOR WOMEN

Calorie counting is often complicated, tedious, and inaccurate. So, at Precision Nutrition, we’ve come up with an easier way to control calories. No weigh-scales or measuring cups. No calculators or smart phones. Just the ability to count to two.

And your hand. To build your meals:

1. palm of protein dense foods with each meal
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4. entire thumb of fat dense foods with most meals

Note: Your hand size is related to your body size, making it an excellent portable and personalized way to measure and track food intake.

Also note: Just like any other form of nutrition planning, this guide serves as a starting point. Stay flexible and adjust your portions based on hunger, fullness, and other important goals.
Hydration

Proper hydration is just as important, if not even more important, for athletes than your food choices. Truth is, water is the most important nutrient as minimal fluid loss can negatively impact physical and mental performance. It takes a mere 1% – 2% body weight loss in water to significantly hinder performance.

Weight lost during activity (practice, training, game) is NOT fat loss, it is fluid loss.

A good habit to get into is to weight yourself pre- and post-activity. For every 1lb loss in body weight drink 2 cups (16 ounces) or water.

I’m sure everyone has seen some version of the following chart. The best marker of your hydration level is your urine. Begin to monitor your urine color. If it is the color above the blue line then keep doing what you are doing. If it is any of the colors below the blue line then drink more water.

<table>
<thead>
<tr>
<th>1</th>
<th>If your urine matches the colors 1, 2, or 3, you are properly hydrated. Continue to consume fluids at the recommended amounts.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>If your urine color is below the BLUE line, you are DEHYDRATED and at risk for cramping / a heat illness!</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>YOU NEED TO DRINK MORE WATER / SPORTS DRINK!</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

If you struggle to drink the appropriate amount of water here are a few tips to help:

- Drink one glass (8-ounces) upon waking up in the morning and one glass before going to bed
- Always include one glass with every meal
- Shoot for 1 glass for every 15-minutes of activity (training, practice, or game)
It is important to know the signs of dehydration. Early signs are:

- Thirst
- Flushed Skin
- Premature Fatigue
- Increased Body Temperature
- Faster Breathing and Pulse Rate
- Increased Perception of Effort
- Decreased Exercise Capacity

Later signs include:

- Dizziness
- Increased Weakness
- Labored Breathing with Exercise

**Action Steps:**

1. Drink Early, Drink Often
2. Shoot for half your body weight in ounces of water per day (200lb athlete should get at least 100-ounces of water per day)

**Body Composition – Gaining/Losing Weight**

Achieving an optimal body composition can be a challenge for many athletes. The goal is to achieve your optimal body composition while maintaining the ability to compete at a high level.

**Gaining Weight**

Gaining weight is easy. Gaining lean body mass at the expense of body fat can be a challenge. A good general recommendation is to increase quality calorie intake by 500 calories per day. Quality calories would include lean protein, high fiber carbohydrates, and healthy fats. If you are using your hand to determine quantity sizes for your meals then just increase the sizes a little bit. Here are some easy ways to add calories to your diet:

- Add Low Fat Milk
- Snack Regularly
- Add Nuts and Peanut Butter to Meals
- Add Hummus and/or Avocado to salads and sandwiches
- Make Shakes and Smoothies with Fruit, Protein Powder and Milk, Greek Yogurt, or Cottage Cheese

**Losing Weight**

Just like the general recommendation for gaining weight is to increase daily caloric intake by 500 calories, the general recommendation for losing weight is to decrease caloric intake by approximately 500 calories per day. The big key is to maintain as much lean body mass as possible while losing body fat. To do this do not cut lean protein. Instead focus on empty calories and low quality carbohydrates. Important tips for safe and effective weight loss are:

- Decrease caloric intake realistically
- Don’t skip meals
- Read food labels
- Eat the proper proportion of macro-nutrients
- **Stay Hydrated**
  - Pay attention to portion sizes
  - Eat nutrient dense foods to avoid nutrient deficiencies
  - Set realistic goals
  - Eat high-fiber foods to stay satisfied

**Action Steps:**

1. Gradually increase or decrease caloric intake based on your body composition goals.
2. Never lose focus on the quality of the foods you are eating.

**Game Day Strategies**

Applying specific game day strategies are only effective if you first adhere to quality nutrition habits a majority of the time. Only then will any game day strategies help your performance. The first steps are:

- Meet your daily caloric needs (most athletes fall short)
- Make sure macro-nutrient intake is appropriate
- Always have snacks on hand
- Stay hydrated
- Choose nutrient dense foods
• Shoot for eating every 3 – 4 hours to keep energy levels high
• Prior to workouts choose easily digestible carbohydrates
• Post-workout choose a combination of carbohydrates and protein
• It’s ok to splurge on not so healthy foods from time to time
• Always Remember, Nutrition directly impacts performance

Once you have established these habits then you can implement these simple game day strategies:

• Eat a meal 3 – 4 hours prior to activity
• Hydrate
• Refuel/Rehydrate 15 – 30 minutes pre-game
• Shoot for 8-ounces of fluid 15-30 minutes before a game. Sports drinks can be a good choice here.
• Rehydrate every 15 – 30 minutes during competition
• Halftime snack ideas can include sports drinks, fruit, and/or a snack bar

Action Steps:

1. Before focusing on game-day strategies, first establish proper nutrition habits a majority of the time
2. When you find a game-day strategy that works for you keep it simple and stick with what works

Supplements

Thus far we have talked about how to fuel your body with real food, but what about supplements? Supplements are a $35-billion industry and they promise great results. But do the claims actually hold water or are they just a waste of money. Well, it depends.

Supplements do not require pre-market approval by the FDA. That can make relying on the label challenging. Truth is, what is on the label may not be what is contained in the bottle.
As college athletes you need to be aware of this when it comes to NCAA testing. Consult with NCAA.org for a detailed list of banned substances.

Having said all that there certainly are some supplements that are safe and potentially beneficial. They include:

- Protein Powder
- Omega-3 Fats (Fish Oil)
- Multi-Vitamin/Mineral
- Creatine
- Carb/Protein Ready to Drink Shakes
- Snack Bars

**Protein Powder**

Protein powder can be a great way to get an extra serving of high quality protein. It is very convenient and can be mixed with fruit in a smoothie or with just water, juice, or milk. The kind of protein can be based on taste, budget, and digestive restrictions. Whey Protein will generally be made up by a combination of Protein, Lactose, and Milk Fat. You want to have as much Protein as possible while potentially limiting the lactose if you have problems digesting lactose. The following chart shows the composition difference between Whey Powder, Whey Protein Concentrate, and Whey Protein Isolate. This information makes it very important to read the label. Generally, the products with a higher level of Whey Protein Isolate will be the more expensive products but definitely worth it in terms of digestion and absorption.
Going back to the idea from the Protein section about spreading out your protein intake more evenly throughout the day, one scoop of protein powder generally provides you with 20 – 30 grams of protein. That is exactly the quantity you want per meal.

And what about BCAAs (branched Chain Amino Acids)? Well, here’s a quote from Dr. Stu Phillips:

“The evidence on BCAAs is remarkably weak as to their positive effects and they are not anabolic...Bottom line, if you are taking adequate protein then BCAAs are a complete waste of money”

**Creatine**

Creatine is a natural compound produced by the body with 95% stored in muscle. It is also commonly found in many of the foods we eat. For instance red meat contains 1.4 – 2.3 grams/lb and herring contains 3 – 4.5 grams/lb.

The Creatine-Phosphate energy system is important for quick bursts of energy. All sports rely heavily on power, whether it be at the bat or on the mound in baseball or softball, sprinting in soccer, field hockey, basketball, or lacrosse, tackling and blocking in football, swinging a golf club or tennis racquet, or viciously checking someone into the boards in hockey. Therefore the creatine-phosphate energy system must be well trained.

As for supplementing with creatine, it is one of the most studied supplements available. These studies all show an improvement in strength, power, and speed with NO side effects.
Studies also show that the common practice of loading is unnecessary. 2 – 3 grams per day is enough to get the full benefit.

Creatine alone will not make an athlete stronger, faster, or more powerful. But when combined with proper training it can definitely help to improve the quality of training.

**Energy Bars**

It takes just one trip down the energy bar aisle at the grocery store to see that there are hundreds of different bars on the market. Most are made with cheap ingredients and taste terrible. Some, however, are definitely worth the money. And they can certainly play a role as a convenience food.

**Protein Based “Energy” Bars**

<table>
<thead>
<tr>
<th>PROTEIN BARS</th>
<th>Brand</th>
<th>Calories</th>
<th>Carbohydrate</th>
<th>Protein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clif Builders Bar</td>
<td>270</td>
<td>30</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>PowerBar Protein Plus – Vanilla Yogurt</td>
<td>300</td>
<td>38</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Odwalla Super Protein</td>
<td>210</td>
<td>30</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Detour Bar – Caramel Peanut</td>
<td>350</td>
<td>32</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Quest Bar - Chocolate Peanut Butter</td>
<td>160</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Luna Bar – S’mores</td>
<td>180</td>
<td>27</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

As you can see the Quest Bar is generally one of the top bars on the market. It is also one of the top bars for anyone on a budget.

**Carb/Protein Ready to Drink Shakes**

There are just as many Ready to Drink shakes on the market as there are snack bars. Again, it all comes down to quality and budget. As you can see in the following chart, chocolate milk definitely provides the best “bang for the buck.” Chocolate Milk provides you with the carbohydrates you need to fuel your muscles along with the protein you need to help build muscle.
**Omega-3 Fats**

A good fish oil is a staple supplement for most people and with good reason. We do not get nearly as much healthy fats in our diets as we should. The benefits were listed earlier and are numerous:

- May help with recovery
- May decrease inflammation
- Possible anabolic (muscle building) properties
- May help with concussion prevention and recovery

Shoot for a minimum of 500mg of DHA and EPA per day.

**Multi-Vitamin/Multi-Mineral**

The big key is to look at the label. Many multi-vitamins will show over 100% of the recommended RDA for some of the vitamins contained. This is not necessary. Look for a multi-vitamin with 100% of the RDA recommendation.

Remember, this is not a replacement for a quality diet. These are a supplement to already quality eating habits.

Look to consumerlab.org for reputable products.
Putting It All Together

Well, you have made it through the Nichols Strength & Conditioning Guide to Performance Nutrition. As a collegiate athlete you have many demands on your time. You have to juggle classes and studying with practice, training, and games. Taking steps to improve your nutrition will help you have more success not only on the field, court, or ice but also in the classroom. What follows in this last section is a summary of all that was covered in this manual along with some practical ideas to help you be as successful as possible.

Refuel

Eat carbohydrates and protein soon after a workout and throughout the day. Some great pre- and post-activity meal ideas are:

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<table>
<thead>
<tr>
<th>Resources for Reliable Supplement Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>• NCAA.org</td>
</tr>
<tr>
<td>• Informed-Choice.org</td>
</tr>
<tr>
<td>• National Institute of Health</td>
</tr>
<tr>
<td>• ConsumerLab.com</td>
</tr>
</tbody>
</table>

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Action Steps:

- Supplements are not a replacement for a high quality diet, but some can definitely help in terms of health, recovery, and improving the quality of training.
- Find the best “bang for the buck” products that fit in with your preferences and budget.
- Homemade protein smoothie
- Chocolate milk – the perfect recovery food?
- Greek Yogurt with fruit
- Cottage Cheese with fruit
- Turkey sandwich
- Grilled Chicken Wrap
- Banana or Apple with Peanut Butter
- Energy Bar

**Repair**

While we focused on nutrition in this manual, being diligent with your recovery is critical to success as well. This includes:

- Foam Roll and Stretch
- 7 – 9 hours of sleep per night
- Active recovery work and mobility work
- Schedule your days so you don’t fall behind with school work

**Rebuild**

Focus on fueling your body with the proper levels of carbohydrates, protein, and fats throughout the day. Be consistent! Find what you like and make it repeatable. Some great snack ideas are:

- Nuts/Trail Mix
- Homemade protein smoothie
- Beef Jerky
- Peanut Butter and Jelly or Peanut Butter and Banana
- Greek Yogurt

And, of course, do not neglect your hydration.
Conclusion

Hopefully this manual will help you to make better choices when it comes to how you fuel your body. Proper nutrition is just as big of a component to athletic success as training and practice. The key is to not get overwhelmed. Start simple. Focus on the quality of carbohydrates. Spread your protein throughout the day. Get in some healthy fats. And make sure you are properly hydrated. Find what works for you and repeat it.

Please do not hesitate to reach out with any questions. We are always available to help you become the best student-athlete possible.

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508.213.2189
References

The content of this manual came primarily from:

- Precision Nutrition
- Athletes Acceleration Complete Sports Nutrition
- NCAA
- NSCA