



FACT SHEET

Increasing muscle mass

Bulking up can be important in the development of an athlete. For almost all athletes, the goal is to increase muscle mass and strength; few plan to increase body fat. For a gain in muscle mass, the combination of a well-designed training program plus an energy-rich diet with adequate protein is essential. Muscle mass is influenced by an array of factors including genetics, training programs, training history and diet. If all are optimised, gains of 0.25-0.5 kg per week are possible initially but will depend on genetics and training history. Overall body composition goals must also be considered. Far too many athletes want to increase muscle mass and reduce body fat simultaneously. This is not achievable for most individuals as gaining muscle and losing fat have mutually exclusive nutritional goals. To promote gains in muscle mass, the priority must be to increase overall energy intake while effective fat loss demands a reduction in energy intake (see [Fact Sheet 4 – Body Fat Control & Making Weight](#)). Priorities must be set with training and diet adjusted accordingly.

Increasing Energy Intake

Increasing dietary energy intake (i.e. kilocalories or kilojoules) is essential if significant gains in muscle mass are to be achieved. For some athletes this can be a real challenge. Frequent and/or prolonged training sessions can limit opportunities for meals and snacks while intense training can curb your appetite. Novel strategies like eating more energy-dense snacks and drinks may be required to overcome such obstacles. While an increase in energy intake is essential for gains in muscle mass, it should not be considered an excuse to indulge in high-fat, nutrient-poor, convenience food. Additional dietary fat may increase body fat that will have to be reduced at a later stage, although for some athletes, extra nutritious high fat foods like nuts and seeds may be an important inclusion to assist with increasing energy intake. For those concerned about gaining extra body fat, small increments in energy intake should be introduced until desirable results are achieved. Regular body composition assessment may help to alleviate concern among athletes with weight gain fears.

Nutrition to support Training

Recent research suggests that nutritional support of training with both pre and post training snacks rich in carbohydrate and high quality protein creates an environment most conducive to gains in muscle size and strength. The protein helps to further stimulate muscle building while the carbohydrate provides additional energy to fuel training and also reduces protein breakdown.

Tips for increasing energy intake

- Increase meal / snack frequency. It's easier to eat more frequently than increasing the size of existing meals and snacks. This should become a priority, even during busy days. Aim to include three main meals and multiple snacks each day, including pre and post training snacks.
- Make use of energy-dense drinks (e.g. smoothies, milk shakes, powdered meal replacement formulas, fruit juice, cordial, sports drinks) and other nutritious, energy rich foods (e.g. cereal bars, dried fruit/trail mix). Skim milk powder can be added to homemade milk drinks for an extra protein and energy boost. These drinks can be particularly useful for athletes unable to tolerate solid food before/after exercise or those with smaller appetites.
- Moderate intake of high fibre options. As you look to increase your overall food intake, allow your intake of low energy fruit and vegetables to remain steady. Although a great source of important nutrients, maintaining your intake of these foods will allow more room for energy-dense, nutrient-rich options.
- Plan the day's intake of food. This ensures suitable foods and drinks are at hand as needed. Keep a ready supply of non-perishable snacks in your training bag e.g. tetra packs of UHT flavoured milk/fruit juice, cereal bars, dried fruit, powdered meal replacement formulas and sports drinks.

Furthermore, this positive balance between muscle building and breakdown can be achieved with just 20-30 grams of carbohydrate and 10-20 grams of protein, amounts even individuals on a low energy budget can afford. As a rule of thumb, if there is an hour or more since you last ate, include a pre-training snack that provides a good mix of carbohydrate and protein. This should be matched by a similar snack following training to achieve both muscle building and recovery goals, particularly if your next meal is scheduled one to two hours away.

Pre and Post Training Snack Ideas

- Tub of yoghurt & fruit
- Bowl of cereal & milk
- Sandwich with lean ham & salad
- Low fat instant noodles, pasta sauce & 'light' cheese
- Homemade smoothies on low fat milk, yoghurt, honey and a banana plus a scoop of skim milk powder for an extra energy boost
- Fruit muffin & glass of milk
- Breakfast/cereal bar & liquid meal supplement

Each snack provides at least 10 grams of protein and 35 grams of carbohydrate which recent research indicates is enough to promote protein building during exercise.

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More Protein?

While most athletes associate eating extra protein rich food with muscle building, the reality is that most hard training athletes are already consuming more than adequate protein. Rather, they should focus their attention to a wider distribution of this protein over the day. Including a small serve of protein rich food at each meal and snack throughout the day helps to create an optimal environment for gains in muscle mass. This may be particularly true for meals/snacks taken before and after a weights session. Just a small amount of protein and carbohydrate taken before and after exercise further enhances the muscle-building promoted by weight training. If you train early in the morning, a pre-training snack is an excellent start to the day. Further information on protein needs can be obtained from Fact Sheet 5 – Protein for Athletes.

Supplementary Support?

Athletes attempting to increase muscle mass are particularly vulnerable to the emotive marketing of supplements promoted to build muscle. Popular muscle building supplements include creatine, HMB, nitric oxide, colostrum and individual amino acid supplements through new sports bars, drinks, pills, powders and other potions arrive in the market place frequently. However, most of these products fail to live up to expectations and the scrutiny of scientific support. Liquid meal supplements and creatine may be an exception to the rule. The support of a sports dietitian will not only help you identify fact from fiction in the supplement industry but also provide guidance on appropriate protocols for use.

Liquid Meal Supplements

For individuals who struggle to achieve increased energy needs, liquid meal supplements or 'protein powders' offer convenient, compact options for boosting energy, carbohydrate and protein intake when everyday foods are not available or are impractical to consume. When choosing a protein powder, look for one that is rich in carbohydrate, moderate in protein, low fat, fortified with vitamins and minerals, tasty and economical. Alternatively, home made shakes can be made up to provide a similar nutrient profile at a fraction of the cost.

Creatine

Creatine supplementation is particularly popular among athletes attempting to increase muscle mass. While debate continues over the direct muscle building effect of creatine, it may indirectly support gains in muscle mass by promoting recovery between exercises and allowing you to do more total work.

(see [Fact Sheet 3 – Creatine supplementation and sports performance](#)) Support for the muscle-building claims associated with other products like HMB, colostrum, chromium and specific amino acids are limited or lacking. Stick with the proven winning formula of a well planned training program and meal plan. 'Magic bullets' will come and go, but truly successful muscle building programs are based on hard training and a well planned daily intake of food.

Training

To gain muscle mass, a muscle-building phase needs to be incorporated into your yearly training program. This might emphasise resistance training sessions each week in conjunction with a drop in overall training volume, especially conditioning sessions that eat into energy reserves required for gaining muscle. The off-season is an ideal time to work on muscle mass gains. A strength and conditioning coach can help you develop an effective training program to achieve the right balance between resistance and other training.

Summary

- Increase daily energy intake by increasing meal/snack frequency and making use of energy-rich drinks/snacks.
- Moderate intake of higher fibre, filling foods.
- The meal plan should be based on nutritious carbohydrate-rich foods, and include a small serve of protein-rich food/fluid at each meal/snack to optimise training responses, especially before and after training.
- Get organised - plan food and fluids throughout the day to make sure suitable choices are always available.
- To increase muscle mass, a muscle building phase should be incorporated into the yearly training program, emphasising resistance training sessions and limiting additional fitness/conditioning sessions.
- Only after training and diet have been optimised should you consider a sports supplement. The professional support of a sports dietitian can help you determine the best supplement for you.
- Set realistic goals and monitor progress regularly. To see how effective your training program is, assess your body mass and composition.
- Commitment, perseverance, and consistency are essential. Developing optimal levels of strength and muscle mass for your sport may take years, especially if you don't have the luxury of a prolonged off-season each year.