

# SN FORUM

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**Sports  
Nutrition  
Forum**

A Newsletter for Sports and Fitness Professionals



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## Rugby and soccer coaches upskill their nutrition knowledge

As part of the 'Milk It For All It's Worth' campaign, the National Dairy Council (NDC) hosted two regional seminars in Dublin this summer. The aim of these seminars was to upskill coaches working with teenage players by providing practical nutritional advice that can help to improve sports performance to the best of each young person's ability. These regional seminars were financed with aid from the European Union, the National Dairy Council and the Department of Agriculture, Fisheries and Food.

### NDC/IRFU Seminar

The first seminar took place in Dublin's Aviva Stadium on June 8, 2011, and involved an interactive workshop, along with nutritional advice for coaches of young rugby players. Organised jointly by the Irish Rugby Football Union (IRFU) and the NDC, coaches working with players ranging from about 12–16 years of age were presented with the knowledge and skills to promote the basics of healthy eating and to apply the science of sports nutrition in their role as rugby coaches.

Performance Nutritionists who work with professional rugby players provided expert advice for the evening. Emma McCrudden is based with Leinster Rugby in Ireland and the English Institute of Sport in Bath, and provides expert nutrition advice for elite athletes in order to support their training. Emma explored many topics related to sports nutrition, including the role that fluids have in achieving good hydration. She explained:

"Exercise increases heat production in the body. Good hydration helps to maintain an efficient cooling system, allowing players to sweat effectively to keep body temperature under control. Dehydration due to a lack of fluid availability will result in over-heating and ultimately this can affect the ability to continue with high intensity exercise."

Ruth Wood-Martin currently works as the Performance Nutritionist with the IRFU, and also presented on the evening. At the event Ruth stated: "Food is the fuel used to support the extra energy demand of exercise. The main fuels used during exercise are fat and carbohydrate, and both of these fuels are stored in the muscles that allow them to work during exercise. Without sufficient amounts of the right type of fuel, every athlete's ability to perform in sport will suffer."

Following their presentations, Emma and Ruth then put IRFU coaches to the test. Once divided into groups, each group was given a specific case study and challenged to devise a meal plan for a certain player. The teams of coaches needed to consider factors such as the age of the individual, training schedules, specific nutrient needs and the timing of the meal such as before/after playing sport. The team then had to select from a range of foods on display in order to make up their chosen meal plan, and explain why they chose those particular foods. This seminar certainly put the science of sports nutrition into practice and the coaches through their paces! For more sports nutrition tips from Ruth Wood-Martin, see page 3.

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### Editorial

In this third issue of *SN Forum* for sports and fitness professionals, we reflect on the success of two regional seminars hosted as part of the *Milk It For All It's Worth* campaign. We also welcome back our regular contributors: Ruth Wood-Martin focuses on nutrition to support training demands, and Dr Tom Hill suggests a diet plan for a judo competitor. Paul O'Connell, Irish rugby player, is the focus of our 'Sports Star Spotlight' feature and reveals his diet and training schedule. We also take a look at the role that milk has for muscle. If you have any comments or suggestions, we would be delighted to hear from you. As always, please feel free to contact us at: [info@ndc.ie](mailto:info@ndc.ie)



Dr Catherine Logan  
Nutrition Manager, NDC



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An Roinn  
**Talmhaíochta,  
Iascaigh agus Bia**

**NDC/FAI Seminar**

A second regional seminar organised jointly by the Football Association of Ireland (FAI) and the NDC took place in Dublin on July 8, 2011. FAI coaches working with players of senior, intermediate and junior levels of football were provided with practical nutritional advice from another two experts, Wendy Martinson and Dr Tom Hill, in the field of sports nutrition.

Wendy Martinson is a registered dietitian and sports nutritionist with extensive experience, having worked previously as a consultant sports nutritionist with the England Football Squad & British Olympic Association. Wendy explained to the soccer coaches that good sports nutrition, and an understanding of ways to improve re-hydration and muscle recovery can help athletes to train and compete harder, and to recover more quickly, so that they are better able to take on their next training session or competition.

Wendy informed coaches that careful 'match day' preparation is also essential. "Ideally, the pre-match meal should contain a rich source of carbohydrate, be low in fat and low/moderate in protein and be consumed approximately 2-3 hours prior to kick off. Players should also ensure they are well hydrated prior to the match and make sure their post match recovery strategy includes suitable fluids."

Dr Tom Hill, Senior Lecturer in Food and Human Nutrition, University of Newcastle-Upon-Tyne, followed up Wendy's presentation with a look at various case studies involving soccer players, including dietary plans taken from two anonymous Premier Division League of Ireland players from the 2009/2010 season. The first case study related to a very experienced player who needed to lose body fat for his position; the second case study explored nutrition advice for a young player who had recently broken into the senior squad and who needed to gain muscle mass. Tom informed the coaches that ensuring players eat and drink properly for peak performance can be a challenging task as it needs continuous player monitoring and compliance with the suggested dietary advice. Turn to page 5, where Dr Tom Hill provides nutritional advice and a meal plan for a young judo competitor.

If you are associated with a sporting organisation that would like to avail of such a seminar, or if you would like more information, please contact us at: [info@ndc.ie](mailto:info@ndc.ie)



L-R: Dr Catherine Logan, Nutrition Manager, NDC; Ruth Wood-Martin, IRFU Performance Nutritionist; Emma McCrudden, Performance Nutritionist with Leinster Rugby; and Tara Regan School Programme & Special Projects Manager.



L-R: Wendy Martinson OBE BSc(Hons) PG Dip, Registered Dietitian and Sports Nutritionist (RSEN); Paul Hamill, Education Manager, FAI; Caroline O'Donovan, Nutritionist, National Dairy Council; and Dr. Tom Hill, Senior Lecturer in Food and Human Nutrition, University of Newcastle-Upon-Tyne, UK.

# Performance and Nutrition:

Ruth Wood-Martin MSc RD SEN is a Registered Dietitian and Sport and Exercise Nutritionist and currently works as the Performance Nutritionist with the Irish Rugby Football Union.

**MILK IT FOR ALL IT'S WORTH**

## Eat to train and train to eat

Once you have got the basics of good eating right (refer to *SN Forum* Issue 2), you can start to plan your eating and drinking to support your training demands. There are huge differences in the nutritional needs of athletes across sports and even within a sport, as well as depending on the phase of training you are in, so the guidelines outlined here are general and will need to be fine-tuned on an individual basis.

### Step 1: Work out your daily fuel needs

The most important consideration for any athlete is to have enough energy to be able to train hard to get the best physical adaptations from exercise sessions. The key nutrient to do this is carbohydrate (stored as glycogen in muscles and liver), and you should make sure you are consuming enough to maintain muscle glycogen levels, which translates into better work capacity during your training. The higher the intensity, frequency and duration of your training, the higher your energy and, therefore, carbohydrate requirement is. Typically, the amount will range from anywhere between 3-10g of carbohydrate per kilo body weight per day, with the lower end representing the light training recreational athlete and the top end, an endurance athlete in a heavy training phase. Often if you are feeling energised, are recovering well between sessions and are at a healthy performance weight, you are probably getting sufficient carbohydrate in. In contrast, poor recovery, lack of energy and unintentional weight loss could all be signs that you are not consuming enough carbohydrate to support your training schedule.

Table 1: Examples of carbohydrate foods. The quantity of each food listed will give you **30g of carbohydrate**.

FOOD	AMOUNT – HANDY MEASURE
Porridge	5 tablespoons
Bran Flakes	4 tablespoons
Weetabix	2 biscuits
White or wholegrain bread	2 slices
White or wholegrain rice	3 tablespoons (cooked)
White or wholemeal pasta	3 tablespoons (cooked)
Potatoes	2 medium boiled
Baked Beans	½ large tin
Milk, all types	1 pint (568mls)
Banana	1 large
Sports drink (6% glucose)	500mls

It is important that you go into an exercise session well fuelled to get the most out of the session. Aim to have your pre-exercise meal or snack to allow enough time for digestion so you feel comfortable. If your exercise session is longer than 30 minutes, you should consume some fuel during the session to keep blood sugar levels topped up, usually in the form of a drink: 30-60g per hour is the general recommendation.

### Step 2: Personalise your protein

Protein is vital for muscle growth, repair and adaptation as well as maintaining strong immunity. Do athletes need more protein than sedentary people? Yes, they probably do, and this applies to endurance athletes as well as those in strength and power sports. But it is important to know that there is a limit to the amount of protein that your body can use to increase muscle size and strength, so eating loads of protein is not the answer for big muscles. The main thing that allows your muscles to grow is the stimulus of proper training, with enough calories and protein to support that growth. For adult athletes, protein intakes of 1.2-1.8g per kilo body weight per day are optimal for both strength and endurance training. We do not store much protein in our bodies, so splitting your protein intake over the course of the day by including some in each meal will help its absorption and utilisation.

Table 2: Protein foods with quantities that will give you **10g of protein**

FOODS	AMOUNT – HANDY MEASURE
Red meat eg beef/lamb/pork	1 small slice
Beef mince	2 tablespoons
Chicken or Turkey	2 small slices
Fish, white or oily	½ small fillet
Milk, all types	½ pint (286mls)
Eggs	2
Yogurt	2 small tubs (2 x 125g)
Cheese	1 medium slice (40g)
Lentils, cooked	3 tablespoons
Nuts	Handful (40g)

### Step 3: Fat finder

Good (essential) fats are necessary for lots of things including brain function, absorption of fat-soluble vitamins, giving a sense of fullness and decreasing inflammation. Dietary fat is high in calories, and athletes

often need plenty of these. However, it is important that you make good dietary fat choices (check out *SN Forum* Issue 2), and keep the fats from processed foods such as biscuits, cakes, pastries and takeaway foods to a minimum.

As your training volume increases (and your calorie needs increase), good fats are an easy and healthy way to push up your overall energy intake. Daily fat requirements for adults can range between 0.8g and 2g per kilo body weight per day.

### Step 4: Fluid facts

Being well hydrated and preventing dehydration during exercise is as important as getting your fuelling right. Your daily fluid requirement will depend on your age and weight: aim for between 30 and 50mls per kilo body weight per day. You then need to add some more in to cover the fluid losses (as sweat) you will have during training – this is very individual and you need to work out what is right for you. Weighing yourself before and after a hard session (with minimal clothing) will show if you have lost any weight during the session, and this weight loss is almost all fluid. One kilo of weight lost is equivalent to 1-1½ litres of sweat (fluid) lost. So if you regularly lose weight after exercise, increase the amount of fluid you are drinking during the session.

Table 3: Drinking during exercise - The key points

• Be responsible for your own fluid bottle
• Drink 200-300mls before your session starts
• If your session is less than ½ hour, water is fine
• If the session is longer than ½ hour, drink fluid with carbohydrate (usually glucose and/or fructose). Isotonic sports drinks have about 6g carbohydrate per 100mls and hypotonic sports drinks are weaker (about 2-3g carbohydrate per 100mls). Diluted sugar-containing fruit squash is an alternative option to sports drinks.
• Drink regularly – don't wait for thirst to set in

In the next article, we will look at the role of nutrition in recovery.

**Sports Star Spotlight**  
**Paul O'Connell**



Paul O'Connell pictured with Zoë Kavanagh, Chief Executive of the National Dairy Council

**Paul O'Connell discusses the importance of diet.**

**“Typical diet:**

For me, I struggle to put on weight so it's a lot about quantity as well as quality. I need to eat a lot. If I get up early and eat well early, the rest of the day is easy for me; but if I get up late, and start late, the rest of the day can be quite a struggle getting everything in. During pre-season when my calorie usage is so high, I don't have to be careful about what I eat during pre-season but in-season, I have to be more careful about what I eat, more disciplined about what I eat. Off-season I can enjoy myself, I eat desserts and food like that but generally I've a healthy diet anyway. I eat a good breakfast, lunch and dinner but around that I'll have a few desserts and let the handbrake off a little bit!

**For breakfast:**

Generally, my breakfast is porridge made with skimmed milk with nuts and seeds and honey in it, and then I'd have a smoothie with milk, banana and some whey protein.

**Advice for aspiring athletes:**

Just enjoy what you're doing. To be in good physical condition, you can't be forcing yourself to be what you're doing. You have to enjoy what you're doing and make everything you're doing part of your lifestyle rather than going on diets or rather than having to change what you're doing.

**The importance of nutritional science:**

I think the science of nutrition is incredibly important. It's all about educating yourself. What I know now in comparison to what I

**Profile**

**Full Name:** Paul Jeremiah O'Connell

**Sport:** Rugby

**Date of Birth:** October 20th, 1979

**Birth Place:** Co. Limerick

**Sporting Influences:**

Anyone Irish that has done well on the world stage... Sonia O'Sullivan, the Irish soccer/rugby team, Irish golfers such as Harrington (Padraig), Clarke (Darren), Walton (Philip), Raferty (Ronan).

**Greatest Sporting Achievement:**

Being part of the team that won the Grand Slam in 2009.

**Training Schedule:**

The week of a game it's generally:  
Monday: weights in the morning (2 hours), analysis, and speed in the afternoon (1 hour)  
Tuesday: rugby in the morning, rugby in the afternoon  
Wednesday: (half day): weights, treatment or speed in the morning  
Thursday: rugby training  
Friday: short team run  
Saturday: match  
Sunday: recovery – usually a swim

**How many calories, on average, do you burn in a training session?**

Per day pre-season, an average of 8,000 calories per day. On a normal training day, it could be about half that, say about 5,000 calories.

knew when I was 22 - even though I was playing for Ireland then as well - there's a massive difference. You have to keep educating yourself all the time.

**Do you drink milk?**

I do, I have it with my breakfast and I drink it before bed because of the casein protein in it which is a slow-burning protein: so I generally have a tall glass of milk before bed.

**Thoughts before a game:**

We have a saying 'Know your job and do your job' and that's what goes through my mind anyway. Also, what I have figured out myself - and what the coaches have helped me figure out - what is required to win the game and focusing on doing it and doing it well.



# Sports Nutrition Case Study: Judo Player



Dr Tom Hill, originally from Cork, is a registered nutritionist and Senior Lecturer in Food and Human Nutrition at University of Newcastle-Upon-Tyne, UK. He has worked on diet and nutrition issues with players, athletes and teams both professional and amateur across a range of sports including Rugby, Soccer, GAA, Rowing and Athletics. He has also published numerous research articles and book chapters in human nutrition and one of his main research interests is the role of nutrition in musculoskeletal health. He has also played rugby for the University College Cork and is currently involved in coaching youth rugby. (Email: tom.hill@newcastle.ac.uk)

## Sample daily meal plan (2,300 Kcals)

### 8am: Breakfast

Medium bowl microwaved porridge made with skimmed milk  
1 low-fat fruit yogurt with a handful of mixed berries  
Cup of tea/coffee with milk

### 10.30 am: School snack

Granola bar

### 1.00pm: Lunch (at school)

Tuna salad with wholemeal pitta: 100g tuna, tomato, cucumber, light mayo  
1 cup homemade vegetable soup  
Apple

### 4.15pm: Training (60-75 mins)

### 5.30pm: Post training snack

Pint skimmed milk

### 6.30pm-7.00pm: Dinner (home)

Beef stir fry with lean beef strips (5oz), olive oil, peppers, onions, beansprouts, sweetcorn and 5 dessertspoons cooked wholegrain rice  
½ sachet of ready-to-eat black bean sauce  
2 scoops low-fat vanilla ice cream  
Tea/coffee

### Evening snack:

1 low-fat yogurt or pear/apple - only if hungry

### 11.00pm: Bed

## Case study:

Seventeen-year-old Niamh is preparing for her third National Judo Championship and this year will compete in the junior class. Her ideal competition weight is 62kg, which allows her to compete in the U-63kg weight category. However, after the summer holidays, with 8 weeks to prepare for her big weekend, she weighs 66kg and thus needs to lose close to 4kg. She understands that gradual weight loss without severe food restriction is the best way to lose her weight so as to ensure she still has ample energy for training. She eats a wide variety of foods but does not like green vegetables.

## Nutritionist recommendations

Initial estimated daily energy requirements based on weight, height and training for an hour 6 days a week (for the first 2-3 weeks): 2,300 kcals/day (allowing for a 15% energy deficit consisting of 60% carbohydrate; 20% protein and 20% fat).

## General notes to the athlete:

### General nutritional guidelines for body fat loss during competition prep

- Aim for about 4-5 small meals a day to prevent the athlete from going hungry.
- Aim again for the guidelines set out in the food pyramid. Do not restrict the diet to a limited variety of foods.
- Choose bulky foods if hungry e.g. apples, pears.
- Grill, steam or boil meats instead of frying.
- Choose lean cuts of meat (remove skin and visible fat if possible).
- Always go for low-fat choices and, if possible, even fat-free.
- Follow pre, during and post training nutritional guidelines as usual including water intake.
- Do not eat within 2-3 hours of bed.
- Stick to low glycaemic index carbohydrate foods as much as possible e.g. oatmeal, wholegrain cereals, milk and plain yogurt.
- Also ensure a regular aerobic exercise programme is undertaken at least twice a week (seek advice from a suitably qualified instructor).
- Avoid 'fad' and 'crash' diets such as the Atkins diet: these diets are grossly inadequate for busy athletes.
- Aim for about ½ kg a week weight loss maximum.

# Sport & Dairy

## What the science says

Studies have demonstrated potential benefits of fluid milk consumption post-exercise on lean mass growth. Two such studies, highlighted below, explored the potential ability of milk in assisting muscle gain, and were carried out by the Exercise Metabolism Research Group, Mc Master University, Canada.

### **Milk promotes muscle gain in male weightlifters**

A study was carried out to determine long-term consequences of consuming milk, soy protein or carbohydrate on lean mass gain following resistance training.

Fifty-six young men (aged 18-30 years) were recruited for the study, and were assigned at random to consume either 500ml of fat-free fluid milk, 500ml of soy protein drink, or a 500ml drink containing carbohydrate (maltodextrin). All three drinks provided equivalent amounts of energy and macronutrients. Subjects consumed a serving of their designated drink immediately after exercise, and again 1 hour post-exercise. Resistance exercise training was carried out 5 days per week, and the study duration was 12 weeks in total. Each training regime consisted of a combination of weightlifting exercises - pushing, pulling and leg exercises - and 60

sessions in total were completed by each participant over the duration of the study. Muscle fibers can be broken down into two main types: Type I (slow twitch) muscle fibers and Type II (fast twitch) muscle fibers. Type I fibers are more efficient at using oxygen to generate energy for continuous, extended muscle contractions and take a long time before they fatigue. Type II fibers do not use oxygen for their energy and are better at short bursts of strength or speed, but they fatigue more quickly.

Results showed that increases in Type I muscle fiber area were greater in the milk and soy group than the carbohydrate group. Greater gains in Type II muscle fiber area and lean mass was observed in the milk group than the other groups. Furthermore, a greater fat mass loss was seen in subjects who consumed the milk post-exercise as opposed to the soy or carbohydrate drinks. It was proposed that this greater fat mass loss in the milk group may be related to calcium intake or a property of the milk proteins.

In summary, the consumption of fluid skimmed milk post-exercise (resistance) promoted greater gains in lean mass, muscle fiber area and a greater fat mass loss than the consumption of an isoenergetic soy beverage or carbohydrate drink.

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Hartman JW *et al.* Consumption of fat-free fluid milk after resistance exercise promotes greater lean mass accretion than does consumption of soy or carbohydrate in young, novice, male weightlifters. *Am J Clin Nutr.* 2007; 86: 373-381.

## **Milk: benefits for body composition, strength and bone turnover in women**

Following the results of their previous study in 2007 (reviewed on the previous page), the Exercise Metabolism Research Group at Mc Master University, Canada, carried out a further study last year involving women aged 20-26 years. The aim was to investigate whether the consumption of fat-free milk following resistance exercise would result in a gain in lean mass and a reduction in fat mass, similar to the results observed in men. Furthermore, the impact of consuming an extra litre of fat-free milk on bone turnover in the female participants was determined by bone turnover biomarker measures.

Subjects were randomised to receive either 500ml fat-free milk or 500ml of an isoenergetic carbohydrate (maltodextrin) drink immediately following resistance training and one hour post-exercise. The study duration was 12 weeks, and participants exercised for 5 days each week. Similar to the protocol adopted by Hartman *et al.*, the female participants

took part in a training regimen which consisted of pulling, pushing and leg exercises. Subjects were instructed to maintain their usual dietary patterns, verified using 3-day food records. Serum samples of each participant were obtained on completion of the study and bone turnover biomarkers were measured.

Results showed that total body mass remained constant for the milk group, but increased slightly in the carbohydrate drink consumers. Lean mass increased with training in both groups, with a greater increase in the milk group. Following the 12-week study duration, bone turnover biomarkers were more favourable in the milk group.

The researchers concluded that the consumption of fat-free milk following resistance exercise promoted greater gains in muscle mass, greater loss of fat mass and increased strength in some exercises compared to those who consumed an isoenergetic carbohydrate drink. Furthermore, more favourable bone turnover biomarker measures in females consuming milk suggests a positive effect for bone health.

Josse AR *et al.* Body composition and strength changes in women with milk and resistance exercise. *Med Sci Sports Exer.* 2010; 42: 1122-1230.

## **Resources and events**

Log onto [www.milkforallitsworth.ie](http://www.milkforallitsworth.ie) to find out more about nutrition for sports and avail of this interactive resource.

The National Dairy Council has a collection of booklets available to download from our website [www.ndc.ie/publications](http://www.ndc.ie/publications)

For more information about upcoming *Milk It For All It's Worth* seminars and events, visit the NDC website, [www.ndc.ie](http://www.ndc.ie) or contact us on (01) 290 2451.



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Kevin Doyle  
Republic of Ireland Striker

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