
PRACTICAL APPLICATION

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Nutrition for Open Water Sailing: An Interview With Jeni Pearce, Sports Dietitian

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The article in the current issue of *IJSNEM* on the nutritional needs of a trans-Atlantic rowing event illustrates that our seas and oceans provide great opportunities for extreme sports. Open-water sailing is another unpredictable and nutritionally challenging ultra-endurance sport. In this issue, I talk with Jeni Pearce, a sports dietitian from Auckland, New Zealand, who is internationally renowned for her work with competitors in a number of the world's greatest open-water events.

Jeni, open-water sailing is an activity that few sports dietitians would have much knowledge about. When I worked with an America's Cup crew some years back, I had to ask the skipper to explain the sport to me. (He told me the easiest way to visualize it was to stand under a cold shower, tearing up hundred dollar bills as fast as you could.) How did you first get involved and what were your first impressions of the sport? How do yachtsmen view the importance of nutrition?

I have been involved in sailing for about 14 years now, and it all started with a request from a chef to assist with the menus for a New Zealand Americas Cup challenge based in San Diego. The chief knew of my role in sports nutrition through my involvement with sports teams and private practice. He also knew of my love of the water. For that event, I faxed monthly menus from my base in New Zealand to the USA (no email in those days), allowing for weather, training schedules, and racing. When visiting the base at that time, I was not allowed anywhere near the boat, the sail loft, or anything technical. Things have changed significantly over the years to the point where the sports dietitian has become a true team member. From this involvement, I went on to work with a number of around-the-world races (both teams and individuals) and also the highly successful first kiwi challenge for the trans-Atlantic rowing race.

Off-shore sailing, especially around-the-world sailing, can be dangerous—the risks are high and well calculated. Preparation is the key. There are not many sports where the environmental conditions change so dramatically, where participants may need rescuing and different race schedules occur each time the race is run (usually every 4 years). Coping with all the variables is a challenge. When I began, no research existed, and there was no scientific approach to the food choices taken on these races. Much of the information was carefully guarded and remained the

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property of the crew or skippers. The only consideration was weight (food and sailors). Losing large amounts of bodyweight during each leg was considered normal, and sailors were thought to have had things “too easy” if they didn’t look emaciated on arrival into port. Being hungry or going without food for the last few days of a leg or race was not considered to be a hardship or a sign that food weight had been restricted beyond the minimum. Alcohol consumption (often excessive) was the recovery nutrition plan on arrival at port.

In sailing, the human element was often ignored, with greater focus placed on the weight issues, sails, structural changes to the boat and rigging, and skills of the crew. Initially, sailors were very suspicious of sports nutrition as they assumed it would involve “lots of dieting and diet food.” Traditionally, one member of the crew was delegated the task of organizing the rations, and this was often not a popular choice. Once the benefits of sports nutrition practices were explained, most sailors were keen and enthusiastic in adopting the recommendations. Key selling points were reducing the loss of lean mass (for strength), maintaining muscle glycogen and blood glucose levels (for endurance, concentration, and coordination) and maintaining fluid balance (for many performance benefits). Sailors were often much easier to convince than the skippers. While some skippers seek every competitive advantage, others are reluctant to change traditional practices that have worked well in the past and are influenced by the common food myths. As the gaps in technical advances in sailing and technology in boat design narrow, the health and performance of the crew is receiving greater attention to obtain a competitive edge. Sports science and sports medicine support in sailing has advanced significantly in recent times.

Sailors often need to experience things before they will accept change. This comes from a history of testing and trialing in boat designs, sails, and other technology (weather). Today, all levels of competitive sailing from the Olympic classes through to Americas Cup events and around-the-world sailing consider sports nutrition important. It is now an integral part of sailing programs rather than a luxury or an “add on.”

You’ve worked with teams involved in the Whitbread/Volvo Round-the-World Yacht Race and the BT Challenge Race. Can you explain the rules and conditions of each event, especially as they impact on the nutrition of the crew?

Each sailing event is unique due to differences in the race rules, race length, length of each leg, the various stopovers (ports visited between race legs), restrictions in boat design, numbers of crew and type or class of boats. Race attributes range from sailing around the world without stopping, breaking race records (speed events), sailing backwards (against prevailing winds and sea currents), and can include days or months at sea. With the Volvo race, there are no official restrictions or race rules regarding food, except for the emergency food and fluids that must be carried by each boat. The main restrictions are the weight restriction imposed by the skipper or crewmembers. Freeze-dried food (meals and individual food items) make up the bulk of the food supplies, as these are light in weight and only require rehydration.

For the BT Challenge, the only variables between boats are the crew and food. In this race, where I worked with team Compaq, we achieved a notable outcome when comments started coming back from each port, that our crew was much healthier than the other team. Halfway around the world (in Wellington, New

Zealand), the secret was out that team Compaq had assistance from a sports dietitian, that freeze-dried food was a major part of their supplies, and sports drinks were on board. Whereas the other crews used 5 containers of gas for cooking, team Compaq used one per leg. As a result, several of the other boats changed their provisions.

The BT race conditions allow a few more luxury items compared to the Volvo races. For example, boats have a galley for cooking and food storage, each sailor has their own bunk, and there are provisions for some luxury food items such as juice concentrate. The crewmembers actually pay to be part of the BT event. In contrast, the Volvo event is more extreme in the area of saving weight. This means limited bunk space, no galley, tighter weight restrictions on food, food is stored in bags that can be moved around to assist with ballast, and no luxury food items. Damage and breakage (such as broken mast and rudders) can force early withdrawal from racing.

I imagine that nutritional concerns are specific to each event. However, what are some of the general nutrition challenges in open water sailing? And what are the specific issues that require different management for each event?

A major nutrition concern is maintaining hydration and encouraging the use of sports drinks. In most races, water is too heavy to carry on the boat or is used as ballast. Therefore, drinking water is made on board via a desalinator—using the process of osmosis to remove the salts from the seawater. Both manual and mechanical desalinators are often on board and, if these break down, it can be life threatening. Only a limited range of freeze-dried food can be cooked in salt water (usually pasta), and teams have almost been forced to withdraw from races when the water makers have broken down. One team was restricted to 2×250 ml of water through the warmer part of a leg due to a broken desalinator. But, even when the process is working well, it changes the taste of the food and drinks. Motion sickness provides another challenge to food and fluid status.... Even the most experienced sailors experience motion sickness, especially in the first few days from leaving shore or during extreme weather. Medications will be important in managing this problem, but hydration strategies including the use of sports drinks also play a key role.

Working with a team is a challenge, as the crew is composed of a range of ages and body types. “Best fit,” or average data, are often applied—since the crew shares all the meals there is no room for individual meal plans. Calculations are based on energy equations and adjusted to 24 hours of activity and the leg length. Energy demands must consider a range of extremes—the sailors are racing 24 hours around the clock, and the weather will dictate sleep and rest cycles. Activity ranges from crawling through the doldrums (the equator) with lots of tacking to catch every breathe of wind, to surfing in gale force winds in the southern ocean and dodging ice bergs. Temperatures range from below freezing to in excess of 45°C . Sleep deprivation and the impact on metabolic rate and energy needs is an area of interest.

Menus are developed to suit “average” requirements but, in many races, I have needed to accommodate the special needs of individuals—for example, food allergies, intolerances, or aversions ranging from shellfish, tomato, banana to gluten-containing foods. The key factor in determining food choices is the weight the skipper will allow to be carried. Enormous effort is made to select supplies that provide maximum nutrients and energy for minimal amounts of weight. Sometimes, even after menus have been organized and the food supplies have been

packed, food has been left behind on the dock in an effort to save weight to make the boat faster. Usually this is to the detriment of the health of the sailing crew.

What processes or principles do you use to estimate an individual's needs for energy during open water sailing?

When working with a new crew, I calculate the energy requirements for each sailor. I use the Harrison-Benedict equation, because it is known to underestimate needs and allow for weight loss within the food and nutrition plan. This process assists me to see the range of energy needs within the crew and highlights individual sailors who have higher energy needs. Anthropometric data are collected on the sailors and monitored during racing to provide some feedback on how successfully energy needs are met.

How do you devise nutrition plans and menus to manage the weight and space limitations on board a boat? How do the sailors deal with food preparation and cooking when there are limited kitchen facilities on board, or limited time for meal preparation? What everyday foods can be used in the nutrition plan? What specially prepared foods and nutrition products have you worked with?

In past years, catering in Volvo races relied on two pots or pressure cookers on gas burners. One was used to cook a protein item with the vegetables, and the second was for the carbohydrate choice (instant potato, freeze-dried rice, or freeze-dried pasta). An alternative is to place the dry food into an insulated self-sealing bin, pour in boiling water, stir, and leave to stand for 25–30 minutes to “cook.” This allows sailors to source the food at times that suit them during the race. Meals and snacks are based around a 24-hour timeframe, but portion control is difficult, and often two sittings occur for meals. Care is needed in cleaning to avoid the risk of food poisoning.

When I first started my work with sailing, there was a very limited range of suitable menu items. The advances in technology and the use of freeze-dried food have significantly improved the quality of meals the sailors eat and reduced both the amount of food weight carried and gas for cooking. Initially, only a limited range of freeze-dried vegetables (peas and corn), some fruit (apples) and meats (minced beef and sliced meat) were available. Today complete meals, desserts, smoked fish, egg dishes, and breakfast combinations are available. A range of companies provides meals or recipes to specification (based on weight, nutrient profiles, packaging requirements, and vacuum packing). An advantage in New Zealand is the willingness of companies to run smaller batches for specific events and assist in recipe development of new menu items. Some individual single serves are provided to give sailors the opportunity to decide the timeframe for consumption and to be more adaptable to watches (sleep, standby, or active watch). No glass or cans are carried on board for safety and hygiene.

Snacks and fluids are an important part of the total nutrient profile and provide more energy and carbohydrate than the main meals. Up to eight snacks can be planned over a 24-hour timeframe. A range of milkshakes has been developed to specifically meet the needs of the crew and to top up the lack of nutrient density that occurs with limited menu items and weight restrictions. This also reduces the need for additional packets or bottles of supplements to be carried on board. These shakes are provided to sailors who require additional fuel and can also be used to replace

meals when weather dictates. Sailors are also taught how to extend meals should race legs run over or weather patterns make legs longer than anticipated.

Can you describe the logistics of preparing a boat to leave for a long event? What is your role? How do you manage to get everything organized and on board? How do you deal with this aspect when the boat has docked somewhere around the world and is preparing to set out again?

There are a number of ways the food supplies may be organized, and communication regarding crew plans and timeframes is crucial. Food for the whole race (often over a year's supplies) may be packed into legs, stored in New Zealand, and then shipped around the world to each port. The limitations of this are that the menu can't be altered and the shelf life of some foods is limited. An alternative is to pack half the food supplies for race, ship to the start (the team management becomes responsible for getting the food for each leg to the appropriate port), and repeat the food packing at the halfway stage. This is a good compromise. The preferred method is to pack each leg and ship to the port direct as this allows for changes to be made to menus, allows for more variety (new menu items can be easily added) and the stock is fresh. To make all this happen, I now hold an export license and a customs card. I work closely with shipping agents and spend time getting to know shipping schedules for both sea and air cargo. Timing is everything.

Being able to count accurately is crucial!—you don't want one bar or serving missing, or even an extra bar. There is no convenience store in the middle of the ocean to stop for additional supplies. All meals are triple checked during the packing phase. An emergency supply equal to 10 days food for the team is always held in reserve, and this is used when breakages (e.g., demasting) occur. Over the years, this food has been offered to competing teams by team management during difficult times.

Prior to the start of the race and the beginning of each leg, a pre-race nutrition program is discussed. There is also an arrival plan for each port, which includes the food and fluids taken to the boats as they sail into port. After each leg, there is advice on weight restoration, and ideas for easing back into normal food or dealing with the food sources at local ports (often foreign countries). In port, the shore crew requires nutrition support as they work around the clock on boat repairs and maintenance. Due to these long hours, meals and fluids are delivered to work sites. Sail makers are another group that often work through the night repairing sails for racing.

Sailors are often out to sea for prolonged periods. How do you manage the emotional side of food—the social aspects of eating, the enjoyment of favorite foods, the use of food to deal with stress or boredom? Are there ways to include these needs in the nutrition plan?

The key is to keep the menu varied and change some of the individual food and menu items for each leg. Treats are packed or smuggled in, especially for birthday and Christmas, but they are always within the weight restrictions. Treats have to provide energy and need to keep well for several weeks—for example, Christmas puddings.

When sailing in the southern ocean, sleep is short, and conditions are wet and cold. One of the few things sailors have to look forward to is their meal. Life on board is based around 4-hour cycles—4 hours on, 4 hours standby, 4 hours sleep (or trying to just stay in your bunk)—and meals tend to fit into these routines. Of course,

anything can happen, and meals can be missed. Desserts (if included) are often strategically placed to boost total energy needs, and sailors have been known to raid future days' supplies in search of specific food items.

What guidance do you have for other dietitians working with athletes in extreme sports? How do you handle the special psyche of these athletes?

These athletes are highly competitive and very serious. They know the risks involved and being "race smart" is an important part of getting their trust. Listening is important. The sports dietitian must be able to explain why certain foods or nutrients are included in terms of sailing performance. How this will help to make the boat go fast is the key to acceptance. Above all the support crew must understand it is a race and usually one that has involved a huge financial contribution.