# VIII TRAIL PORT SANT MIQUEL
# TRAIL RUNNING


## NUTRITIONAL GUIDE

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sport nutrition experience

# Index

## INTRODUCTION

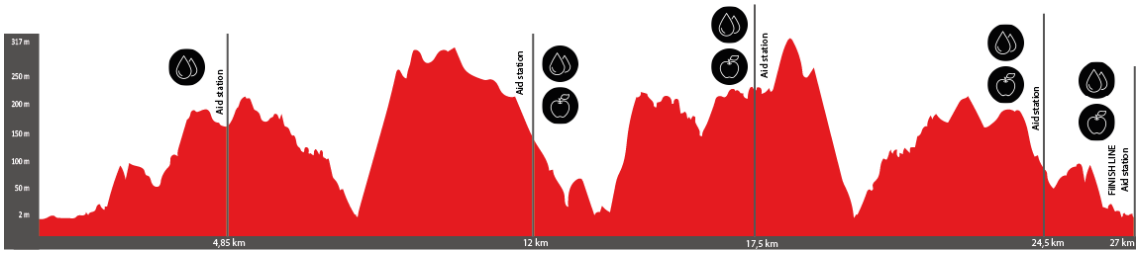
The Spanish Trail Running Championship is an official athletics competition organized by the Real Federación Española de Atletismo (RFEA). In this race runners compete on mountain terrain or natural trails, with courses of varying distances and elevation gains.

This year, the event is organized by Trideporte and it will feature different competition categories, with three race distances of 27, 13, and 8 kilometers, following a circular route starting and finishing at Port Sant Miquel.

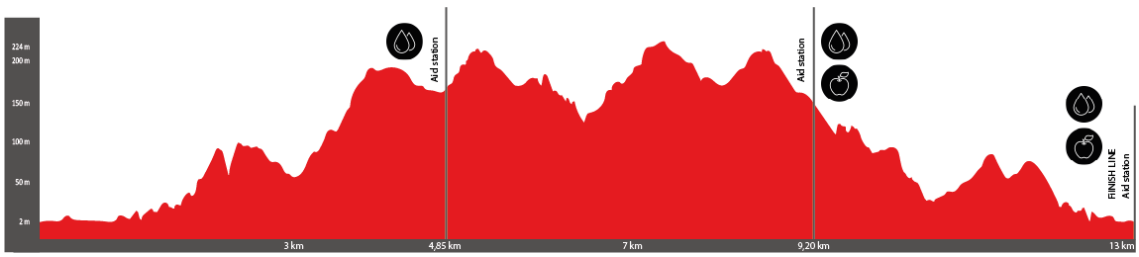
## ELEVATION PROFILES

Participants will experience a technical and demanding course that crosses the northern part of the island.

**27 K TRAIL RACE**
1.616 m E+
Race time limit: 4 h 30'
Start time: 9 h

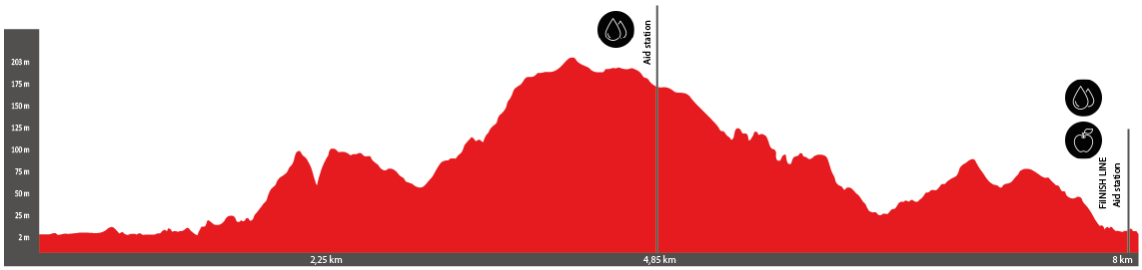



**13 K TRAIL RACE**
644 m E+
Race time limit: 2 h 30'
Start time: 9.30 h



## 8 K TRAIL RACE

395 m E+
Race time limit: 1 h 30'
Start time: 9.45 h




To plan the race correctly, it is important to know the profile, the terrain, and other factors such as the weather conditions along the route. This will allow us to calculate the times for each section and aid station. Additionally, it is recommended to allow an extra margin of half an hour for any potential setbacks.

The uphill sections are areas with high energy and muscle expenditure, so it is recommended to consume more energy than in flat or downhill sections. Additionally, we do not want to focus our efforts on digesting food, so we will opt for easily chewable, swallowable, digestible, and absorbable foods, such as gels, soft bars, quince paste, dates...

Uphill sections are a good time to consume solid foods, complementing them with isotonic drinks for hydration, thus covering the carbohydrates and electrolytes needed each hour.

In the downhill sections, the energy demand is not as high, but it is a time of great muscular and joint tension. Since descents are where falls and injuries are more likely to occur, it is recommended to avoid eating any food that could distract us. However, we must not forget about hydration.

In the flat sections, you can take the opportunity to consume more solid foods, such as a bar or a small sandwich, as long as they don't interfere with your digestion or performance.

We must keep in mind that at the beginning of the race we will be in good condition to digest food, but as it progresses, it will become more difficult. We should prioritize the intake of natural foods during the first part of the course and opt for easier-to-digest options, such as a gel or a bar, during the second half of the race.

## AID STATIONS

Throughout the race, there will be several aid stations where both solid and liquid foods will be offered (water, isotonic drinks, soft drinks, sandwiches, gels, sweets, bread, olives, fruit and 100% natural organic bars with a date and carob base from Bite Boost Win.

It is essential to consume only foods or products that have been tried beforehand to avoid intestinal discomfort that could affect performance.

Before and after each aid station, there will be containers to dispose of waste, as well as an indicator marking the start and end of these waste control points.

At the aid stations, **there will be no cups for drinks, and it will be the runner's responsibility to bring their own cup or bottle**.

It is strictly forbidden to drink directly from the aid station's water tank, and doing so will result in disqualification by the race judge.

| TRAIL RACE 27 K- Checkpoint | Kilometre | Time |
|---|---|---|
| 1 - Liquid aid station | 4,85 | 55’ |
| 2 - Liquid and solid aid station | 12 | 2 h |
| 3 - Liquid and solid aid station | 17,5 | 3 h |
| 4 - Liquid and solid aid station | 24,5 | 4 h |
| 5 - Finish line: Liquid and solid aid station | 27 | 4 h 30’ |

| TRAIL RACE 13 K- Checkpoint | Kilometre | Time |
|---|---|---|
| 1 - Liquid aid station | 4,85 | 55’ |
| 2 - Liquid and solid aid station | 9,20 | 1 h 50’ |
| 3 - Finish line: Liquid and solid aid station | 12,90 | 2 h 30’ |

| TRAIL RACE 8 K- Checkpoint | Kilometre | Time |
|---|---|---|
| 1 - Liquid aid station | 4,85 | 55’ |
| 2 - Finish line: Liquid and solid aid station | 8 | 1 h 30’ |

## SELF-SUFFICIENCY AND PLANNING

The three main objectives on race day are:

- To obtain sufficient energy through carbohydrates.
- To maintain an optimal hydration level, which will be achieved with liquids and salts.
- To minimize muscular damage caused during the competition.

To manage this, we can carry food with us and/or choose products from the aid stations.

We can carry a wide variety of products we know (foods we are not used to may cause digestive issues), in small bags, plastic wrap, or pouches... This will allow us to avoid risks like hypoglycaemia, dehydration, and/or salt deficiency in case of unforeseen circumstances in hard-to-reach areas. Obviously, the less space this takes up in our backpack, the better.

### BREAKFAST

Ideally, one should eat 2 to 2.5 hours before the start of the race to ensure that the food is digested before starting and ready to be used during the first section of the race.

A good breakfast should consist of both simple and complex carbohydrates to provide short- and long-term energy to the body. It is also advisable to include a lean source (low in fat) of quality protein to help mitigate muscle damage caused by events of this type.

Additionally, consuming enough protein will allow for a faster recovery, but to ensure it fulfils its function, it is important to limit its intake primarily to before and after the competition (although in tougher events, BCAAs can be used. These are explained in more detail in the supplementation section).

Once we know which foods to consume, it is also important to pay attention to the nutrients that should be avoided or restricted, such as fats and fiber, as large quantities may cause heavy digestion and hinder the absorption of other nutrients.

Finally, it is worth mentioning that consuming fruit can be beneficial due to its high content of vitamins and minerals (especially potassium, magnesium, and vitamin C). If consumed, it is important to consider its ripeness, as the riper the fruit is, the more easily the carbohydrates it contains will be absorbed.

**Here are some examples of easy breakfasts:**

- Bread with serrano ham/turkey and an orange
- Bread with quince paste or jam, grilled tofu, and mixed berries
- Plant-based drink (or skimmed, lactose-free milk) with cereal and mango
- Corn cakes with peanut butter and banana
- Rice porridge with banana and honey
- White bread toast with dates and low-fat fresh cheese
- White bread toast with an omelette or scrambled eggs and fruit
- Oatmeal porridge with plant-based drink, berries, and a banana
- White bread toast with jam and peanut butter
- Oatmeal and cooked apple with cinnamon
- Oatmeal with low-fat yogurt, banana, mango, or berries
- Homemade energy bar: Oatmeal or granola, honey, banana, and dates
- Oat flour pancakes with egg, banana, and honey
- Low-fat yogurt or plant-based yogurt with granola and berries
- Plant-based drink with oatmeal, dates, and blueberries
- Banana with peanut butter or almond butter
- Rice cakes with caramelized tofu with honey and mixed berries

All breakfast options can be adapted for people with celiac disease or intolerances by replacing gluten-containing foods with gluten-free alternatives.

If you have difficulty eating solid foods in the early morning, a smoothie made with plant-based milk/drinkable yogurt/kefir, cereals, and fruit can be a good option.

**Important: One should not experiment with new foods that haven't been tried before. We should consume foods that we regularly eat and know agree with our body.**

It is also beneficial to include beetroot, celery, or spinach due to the nitrates they provide. Later, the properties and benefits of these nitrates in sports will be detailed.

It is also possible to include a stimulant like caffeine in the breakfast. We must keep in mind that the peak caffeine concentration in the blood is reached 45-60 minutes after consumption, so it will have no effect during the race if consumed 2 hours before the start. Therefore, it is better to include the stimulant about 45-60 minutes before the start.

# SUPPLEMENTATION BEFORE AND DURING THE RACE

## Carbohydrate Supplements

Nowadays, we can find many formats of products that contain carbohydrates for races: gels, bars, maltodextrin, dextrin, free glucose, isotonic drinks, etc. It's important to consider them, as they make it much easier to consume this macronutrient and fulfil the goal of delivering energy.

It's always preferable to ingest carbohydrates from natural foods, such as dehydrated fruit, jam, quince paste, potatoes, sweet potatoes, rice, fruit, etc. However, sometimes it's not entirely convenient to consume these due to the intensity of the effort or the race profile.

## Salts

Their main function is to replenish the electrolytes lost through sweat. They also help absorb water and carbohydrates. The temperature, humidity, time of day, and runner's sweat rate are factors that affect the dose of salts that need to be consumed.

As a general rule, we can consume one salt tablet per hour, but we must maintain a balance between water and salt intake. When taking a salt tablet, it should be accompanied by water, not an isotonic drink. If at any point we notice that our hands are swelling, we should space out the intake of salts.

## Caffeine

Caffeine is the supplement with most scientific evidence, with clear indications of its ergogenic properties. It's important to note that its effect can vary depending on the individual, and there are some people who cannot benefit from it because they do not respond to these effects.

The stimulating effects of caffeine work through two mechanisms: First, they inhibit signals of sleep and fatigue, and secondly, they increase dopamine levels (the hormone responsible for the energy boost).

Caffeine can be taken in different forms, such as gels, bars, energy drinks, tea, coffee, chewing gum, etc. However, it’s important to consider that depending on the type of product, it will take more or less time to reach its maximum concentration in the blood.

For example, in the case of energy drinks, the caffeine peak effect will occur around 30-45 minutes, yet, if taken in tablet form, it may take up to an hour.

If you consider taking caffeine, it should be consumed 45 minutes before you want it to take effect.

Another aspect to keep in mind is that sometimes caffeine can produce the opposite effect (this is generally more associated with coffee than with other forms of caffeine consumption).

To avoid this unwanted effect, we can continue taking small doses of the supplement until the race ends. Therefore, it is important not to take the supplement until fatigue becomes evident.

Another advantage of specific caffeine products is that the exact milligrams of caffeine they contain are known.

Lastly, it's important to mention that if we combine caffeine and taurine intake, the stimulating effects of both are enhanced, and it won't be necessary to take a high dose of caffeine alone. This will provide a more sustained effect over time and will help avoid the crash effect.

## BCAAs

Branched-Chain Amino Acids (BCAAs) are a group of 3 amino acids found in protein-rich foods. Their function, in addition to being used as an energy substrate, is to reduce the use of muscle proteins as an energy source. This helps mitigate the muscle damage caused by the race.

They can be consumed during the race every 4-5 hours, dissolved in water, in an isotonic drink, or in pill or powder form. The usual doses range from 2 to 6 grams, depending on each runner's muscle mass.

## Beta-alanine

Beta-alanine is a non-essential amino acid, which means the body can produce it on its own.

Unlike other amino acids, it does not directly participate in protein synthesis; rather, its main function is to increase carnosine levels in the muscles, acting as a buffer against lactic acid. This helps reduce muscle fatigue and improve performance in high-intensity and endurance workouts.

Main benefits of beta-alanine:

- Increases muscular endurance: It delays the buildup of lactic acid, helping to keep the pace during uphill sections and intense stretches.
- Improves performance in explosive and endurance activities, such as trail running.
- Delays muscle fatigue, allowing for longer training or competition times without feeling as much muscle strain.

Disadvantages:

- It does not have an immediate effect.
- It can cause a tingling sensation on the skin (paraesthesia), but it is harmless

The dose ranges between 4 and 6 grams, divided into several intakes to reduce the tingling sensation.

**Important:** Beta-alanine does not have an immediate effect like caffeine. For it to take effect, it must be taken daily for 2-4 weeks prior to the race to increase muscle carnosine levels. It can be taken at any time, but it is recommended to combine it with food or protein to reduce the tingling sensation.

It should be noted that it takes about 45 minutes to take effect, and its duration is also around 45 minutes from the moment the effect starts.

If we have been taking beta-alanine daily for this race, we can ingest 2 or 3 grams a few hours before the start, keeping in mind that its effect will not be immediate but cumulative.

## Nitrates

Nitrates are compounds naturally found in some foods that have performance-enhancing effects for athletes. This is because, once digested and absorbed, they are converted into nitric oxide, a potent vasodilator that increases blood flow to our muscles, supplying them with nutrients and oxygen.

To include nitrates, we can drink beetroot or cherry juice 30 minutes before the race. If taken, it is possible that urine may turn red, but this is not a cause for concern.

Leafy vegetables like Swiss chard, spinach, and celery are also rich in nitrates. However, these foods are not recommended in the pre-competition diet.

## Menthol

Although menthol is a supplement that requires more scientific evidence, it is gaining increasing popularity in the world of endurance sports due to its potential benefits for athletes. It can generate a feeling of freshness, reduce the perception of effort, regulate body temperature, and help maintain concentration and mental clarity.

The amount of menthol used should be carefully controlled. If taken in excessive amounts, it could cause adverse effects such as skin irritation or irritation of the oral mucosa.

To use it, it is recommended to rinse the mouth with a solution of 0.01-0.1% menthol. During the race, menthol-containing gum or candies, or toothpaste with menthol flavour, can also be used.

## Pickle brine

The intake of cucumber brine is beneficial for athletes who run long distances, especially when the ambient temperature is very high. It has a high content of minerals like sodium and contains water and acetic acid, which helps maintain hydration and prevent cramps or spasms during prolonged physical effort (from a half marathon to an ultra).

Drinking a sip of juice during and/or after exercise helps to restore sodium and potassium levels.

There are alternative foods that provide similar benefits, such as yellow mustard or apple cider vinegar.

# PLANNING

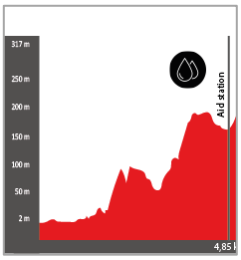
Below we present three plans, one for each of the three profiles for the event, assuming that the athlete maintains a pace of 6-8 minutes per kilometer.

## 27 K TRAIL RACE

1.616 m E+

### 1. Start. Port Sant Miquel – first aid station

| Accumulated | Section |
|---|---|
| 4,85 km | 4,85 km |




The start time is at 9 AM, and we will have already digested the breakfast foods, making them available to be used as an energy substrate. Even though we have enough energy to cover the first part of the race, it is beneficial to start consuming carbohydrates from the very beginning to avoid running out of energy.

During the race, the optimal range is to consume 30-90 grams of carbohydrates per hour. In this first section, consuming around 60 grams will likely be sufficient. To achieve this, the combination of our isotonic drink with water will be enough. If we want to provide more carbohydrates, we can consume fruit, quince paste, dates, a bar, etc.

During the race, the concentration of the isotonic drink can be adjusted depending on whether we want to provide more or fewer carbohydrates. For example, in the first part of this sector, we could consume solid foods and would not need to significantly increase the concentration of the isotonic drink.

- 400 mL of isotonic drink at 8% (4*8) = 32 g of carbohydrates.
- Then, we add a 30-g bar or quince paste portion, reaching 27 g of carbohydrates.

In the second section, athletes will face a significant positive elevation gain in just 2 kilometers. Here, it might be useful to slightly increase the concentration of the isotonic drink, so there is less need to consume as many solid foods. However, we will prioritize easily digestible foods like gels, purees, quince paste, etc. In this section, it is recommended to avoid more difficult-to-digest foods because we want the blood flow to be directed to the legs and not the stomach.

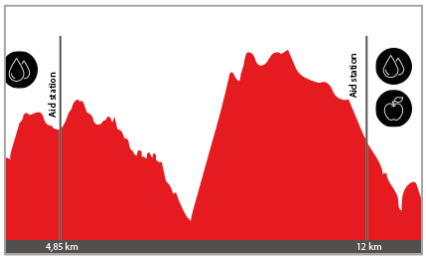
Whenever we consume bars or gels, it is recommended to do so with water to improve the absorption of carbohydrates. Otherwise, intestinal discomfort may occur.

A little before reaching the aid station can be a good time to consider consuming caffeine, which will help us tackle the climb in the second half of the next section.

At the aid station, we can refill our bottles with water and eat carbohydrate-rich options that we carry with us, such as dried fruit, candies, quince paste, as this first aid station will only provide liquids.

## 2. First aid station – second aid station

| Accumulated | Section |
|---|---|
| 12 km | 7,15 km |



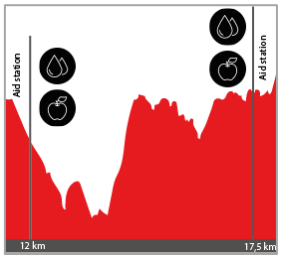

In the first part of this section, we will begin with an ascent, followed by a steep descent, and then another significant climb over just one kilometer. It's important to consume carbohydrate-rich foods, such as a gel, to tackle the climb. If we've planned well (about 45-60 minutes beforehand), caffeine should also start taking effect just as we begin the ascent.

Once the peak is reached, runners will face another steep descent with the second aid station halfway through. During this descent, it would be beneficial to prioritize foods that are easy to handle, like the isotonic drink, and reduce carbohydrate intake since descents are less demanding than climbs.

At this second aid station, we can refill our bottles with water and choose carbohydrate-rich options that we've tried beforehand.

## 3. Second aid station – third aid station

| Accumulated | Section |
|---|---|
| 17,5 km | 5,5 km |




In the first part of the third section, we will start with a descent, followed by a small ascent, and then another descent before beginning a very demanding climb right in the middle of the race.

To tackle the climb, we will take advantage of the descent to consume enough carbohydrates (50-60 g/hour) and hydrate by combining isotonic drink with water.

During this steep climb, it's important to stay well-hydrated and consume easily digestible carbohydrates like gels. We should also take salts, as we will have covered half the distance and it may start to get hot. As always, the intake of salts will depend on the athlete's sweating rate, but as a general rule, around 11 AM, and at this time of year when it may be quite warm, a salt tablet every hour or every 45 minutes would be most appropriate.

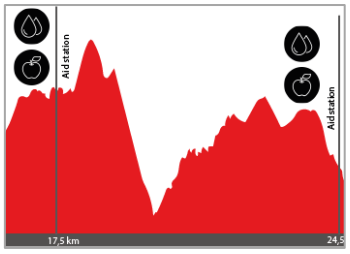
Once we reach the peak, we will continue on more undulating terrain with a final descent and ascent that will take us to the third aid station.

At this point, we can consider the intake of beta-alanine, knowing that it will take about 45 minutes for it to take effect and will last only 45 minutes. If we want it to last until the end and know that we have an hour and a half left to finish the race, we will take the beta-alanine at this moment.

Remember, beta-alanine is a supplement that should be taken daily for at least 2 to 4 weeks before the race to increase muscle carnosine levels.

## 4. Third aid station – fourth aid station

| Accumulated | Section |
|---|---|
| 24,5 km | 7 km |




At this third aid station, we will take the opportunity to consume carbohydrate-rich foods to tackle the next climb. We can choose options rich in carbs that we have already tried previously or opt for a gel, quince paste, etc.

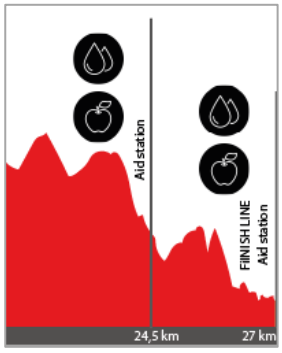
We will stay well-hydrated and begin the climb, followed by a very steep descent of just over one kilometer.

This section is the penultimate one of the race, and before starting the next ascent, we will have already covered around 20 km, and fatigue will begin to set in. To quickly replenish energy, we will take easily digestible carbohydrates, such as a gel or a bar, and stay well-hydrated.

After the climb, there will be a rolling descent leading to the fourth aid station, where we can continue our hydration plan, combining isotonic drink with water, and reduce the carbohydrate intake per hour. If we want to consume solid food, it is smart to do so when the slope is mild or wait until the fourth aid station, but we must keep in mind that we will only have 2.5 kilometers left before reaching the finish line.

## 5. Fourth aid station – Finish line

| Accumulated | Section |
|---|---|
| 27 km | 2,5 km |




After the fourth aid station, the final 2.5 kilometers will start with an ascent followed by the final descent. In this short section, it is recommended to prioritize isotonic drinks.

An extra carbohydrate intake can also be considered at the aid station or just before, such as a gel or some candy.

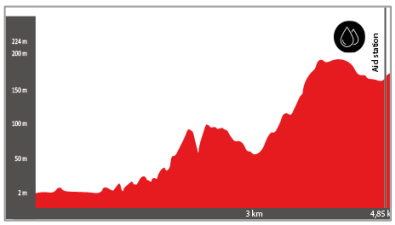
Congratulations on achieving this challenge!

## 13 K TRAIL RACE

644 m E+

### 1. Start. Port Sant Miquel – first aid station

| Accumulated | Section |
|---|---|
| 4,85 km | 4,85 km |




The start time is at 9.30 AM, and we will have already digested the breakfast foods, making them available to be used as an energy substrate. Even though we have enough energy to cover the first part of the race, it is beneficial to start consuming carbohydrates from the very beginning to avoid running out of energy.

During the race, the optimal range is to consume 30-90 grams of carbohydrates per hour. In this first section, consuming around 60 grams will likely be sufficient. To achieve this, the combination of our isotonic drink with water will be enough. If we want to provide more carbohydrates, we can consume fruit, quince paste, dates, a bar, etc.

During the race, the concentration of the isotonic drink can be adjusted depending on whether we want to provide more or fewer carbohydrates. For example, in the first part of this sector, we could consume solid foods and would not need to significantly increase the concentration of the isotonic drink.

- 400 mL of isotonic drink at 8% (4*8) = 32 g of carbohydrates.
- Then, we add a 30-g bar or quince paste portion, reaching 27 g of carbohydrates.

Before starting, we can take the beta-alanine knowing that it will take about 45 minutes for it to take effect and will last only 45 minutes. If we want it to last until the end and we know we will finish the race in about an hour and a half, we will take the beta-alanine just before starting.

Remember, beta-alanine is a supplement that should be taken daily for at least 2 to 4 weeks before the race to increase muscle carnosine levels.

In the second section, athletes will face a significant positive elevation gain in just 2 kilometers. Here, it might be useful to slightly increase the concentration of the isotonic drink, so there is less need to consume as many solid foods. However, we will prioritize easily digestible foods like gels, purees, quince paste, etc. In this section, it is recommended to avoid more difficult-to-digest foods because we want the blood flow to be directed to the legs and not the stomach.

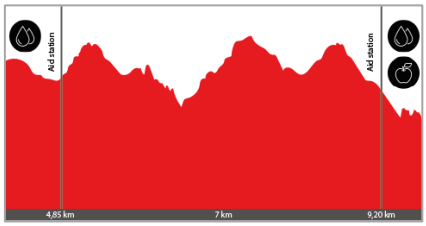
Whenever we consume bars or gels, it is recommended to do so with water to improve the absorption of carbohydrates. Otherwise, intestinal discomfort may occur.

Around 45 minutes before the aid station can be a good time to consider consuming caffeine, which will help us tackle the first climb of the next section.

At the aid station, we can refill our bottles with water and eat carbohydrate-rich options that we carry with us, such as dried fruit, candies, quince paste, as this first aid station will only provide liquids.

## 2. First aid station – second aid station

| Accumulated | Section |
|---|---|
| 9,20 km | 4,35 km |




We will start the first part with a steep climb. It is important to consume carbohydrate-rich foods, such as a gel, to tackle the climb and continue with the subsequent descent. If we've planned well (about 45-60 minutes beforehand), caffeine should also start taking effect just as we begin the ascent

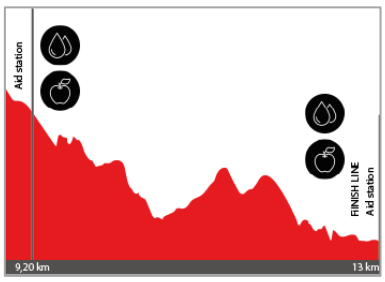
Once we reach the peak, we will begin a descent where it would be beneficial to prioritize easily manageable foods, like isotonic drinks, and we could reduce carbohydrate intake because descents are less demanding than ascents.

During the following climbs, it's important to stay well-hydrated and consume easily digestible carbohydrates like gels. We should also take salts, as we will have covered half the distance and it may start to get hot. As always, the intake of salts will depend on the athlete's sweating rate, but as a general rule, around 11 AM, and at this time of year when it may be quite warm, a salt tablet every hour or every 45 minutes would be most appropriate.

At this second aid station, we can refill our bottles with water and choose carbohydrate-rich options that we've tried beforehand.

## 3. Second aid station – finish line

| Accumulated | Section |
|---|---|
| 13 km | 3,8 km |




After the second aid station, there will only be 3.8 kilometers left to reach the finish line. We will leave this point with a descent where we can prioritize isotonic drinks.

It is also worth considering an extra intake of carbohydrates at the aid station, such as a gel, some sweets, dates, etc., to tackle the final climb before finishing with a descent to cross the finish line.

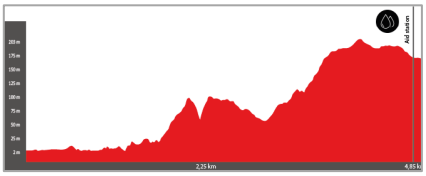
As for hydration, the goal is to continue combining isotonic drinks, water, and salts based on the sweat rate. Congratulations on achieving this challenge!

## 8 K TRAIL RACE

395 m E+

### 1. Start. Port Sant Miquel – aid station

| Accumulated | Section |
|---|---|
| 4,85 km | 4,85 km |



The start time is at 9.45 AM, and we will have already digested the breakfast foods, making them available to be used as an energy substrate. Even though we have enough energy to cover the first part of the race, it is beneficial to start consuming carbohydrates from the very beginning to avoid running out of energy.

During the race, the optimal range is to consume 30-90 grams of carbohydrates per hour. In this first section, consuming around 60 grams will likely be sufficient. To achieve this, the combination of our isotonic drink with water will be enough. If we want to provide more carbohydrates, we can consume fruit, quince paste, dates, a bar, etc.

During the race, the concentration of the isotonic drink can be adjusted depending on whether we want to provide more or fewer carbohydrates. For example, in the first part of this sector, we could consume solid foods and would not need to significantly increase the concentration of the isotonic drink.

- 400 mL of isotonic drink at 8% (4*8) = 32 g of carbohydrates.
- Then, we add a 30-g bar or quince paste portion, reaching 27 g of carbohydrates.

In the second section, athletes will face a significant positive elevation gain in just 2 kilometers. Here, it might be useful to slightly increase the concentration of the isotonic drink, so there is less need to consume as many solid foods. However, we will prioritize easily digestible foods like gels, purees, quince paste, etc. In this section, it is recommended to avoid more difficult-to-digest foods because we want the blood flow to be directed to the legs and not the stomach.

Whenever we consume bars or gels, it is recommended to do so with water to improve the absorption of carbohydrates. Otherwise, intestinal discomfort may occur.

For this 8-kilometer race, we could consider consuming caffeine about 45 minutes before the start so its effects kick in during the first climb and last for most of the race.

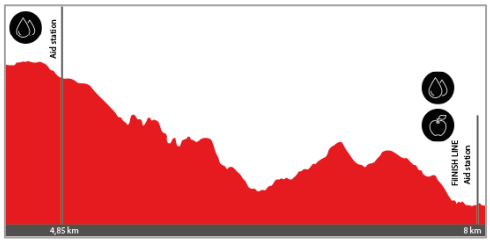
We can also take the beta-alanine, knowing that it will take about 45 minutes for it to take effect and will last only 45 minutes. If we want it to last until the end and we know we will finish the race in about an hour, we will take the beta-alanine 30 minutes before the start.

Remember, beta-alanine is a supplement that should be taken daily for at least 2 to 4 weeks before the race to increase muscle carnosine levels.

At the aid station, we can refill our bottles with water and eat carbohydrate-rich options that we carry with us, such as dried fruit, candies, quince paste, as this first aid station will only provide liquids.

## 2. Aid station – finish line

| Accumulated | Section |
|---|---|
| 3,15 km | 8 km |




After the aid station, there will be just over 3 kilometers remaining to the finish line, starting with a descent where we can prioritize the isotonic drink.

As mentioned earlier, we can have an extra intake of carbohydrates at the aid station, such as a gel, candies, dates, etc., to help with the final climb before finishing with the last descent.

Regarding hydration, the idea is to continue combining isotonic drink, water, and salts (if it takes more than an hour) depending on the level of sweating.

Congratulations on achieving this challenge!

## RECOVERY

After completing races like these, the efforts should focus on restoring the body's normal function and making it easier for it to recover as quickly as possible.

To recover properly, it's crucial to follow the 4Rs rule: **Rehydrate, Recover, Repair, and Rest**.

- **Rehydrate:** Although liquids and salt tablets have been consumed during the race, fluids and electrolytes have been lost. Rehydration is crucial for recovery and should be done as soon as possible and continued in the hours/days afterward. For this reason, it will be essential to consume at least 150% of the body weight lost and accompany it with a source of sodium. Therefore, in the hours following the race, it's important to consume enough fluids rich in electrolytes or complement rehydration with foods high in these minerals.

- **Recover:** Having a meal rich in carbohydrates to replenish muscle and liver glycogen stores is key to proper recovery. During the race, the body's glycogen stores were used and depleted, so it's important to provide carbohydrates in the meals following the race.

- **Repair:** This meal rich in carbohydrates should also be accompanied by high-quality proteins to ensure tissue repair and promote muscle protein synthesis.

To recover and repair, an ideal meal after intense physical effort should consist of a portion of high-quality, easily digestible protein and both fast- and slow-absorbing carbohydrates. Some examples of post-race meals could be:

  - Soy milk smoothie with honey, banana, and kiwi
  - Yogurt smoothie with cereal and berries
  - French omelette sandwich and an orange
  - Rice with grilled chicked or tofu or Heüra
  - Pasta with Bolognese sauce and pineapple
  - Potato with grilled hake/chicken/tofu/tempeh/egg and a mandarin orange
  - Paella or fideuà (Spanish noodle dish)
  - Sandwich with ham (serrano or not), tofu, or hummus

As for fats, they can be included as long as they are not consumed in excess, which can cause digestive issues.

If you're not in the mood for solid food but still hungry, smoothies, purees, or recovery drinks are a great option (like the first two suggestions above). An example would be a smoothie made with liquid yogurt or plant-based milk (you can add isolated protein), baby cereal puree or regular cereal, and a couple of pieces of fruit.

- **Rest:** Rest is essential for recovery, not only from these races but also from daily training. Proper rest and getting enough sleep promote recovery, performance, and overall health.

# POST-RACE SUPPLEMENTATION

## Creatine

It is the most studied supplement with the most scientific evidence, along with caffeine. It presents benefits for athletic performance and offers protection against neurodegenerative diseases.

In sports, it is used for its ergogenic effect during high-intensity, short-duration efforts. However, in this case, it is useful to promote glucose uptake by muscles and the liver. In other words, creatine monohydrate helps optimize the absorption and storage of the carbohydrates ingested.

## Antioxidants

When engaging in sports, the body's oxygen demands increase, and as a result, free radicals are produced—meaning we oxidize. As a consequence, our body activates a series of responses to counterbalance this oxidation. This process is natural and is one of the reasons we adapt to exercise to improve performance. However, when this oxidation is too great, we may need external support. This is where antioxidants, particularly polyphenols, can be very helpful, as they assist in fighting the free radicals that have been generated.

They can be consumed in the form of foods or supplements. That being said, it's likely that after a race like this, our body may not be in a condition to digest post-race meals such as a plate of vegetables and fruits. A multivitamin supplement is a good alternative for athletes with low tolerance for food after the race. A fresh squeezed orange juice is also a good option.

The main dietary antioxidants are vitamins A, C, and E. Vitamins A and C are found in yellow, orange, red, and green fruits and vegetables. It's important to note that vitamin C can be compromised if subjected to heat. Therefore, it's better to consume these foods raw whenever possible. A good idea is to blend them into a smoothie. Some examples of foods containing these vitamins include oranges, strawberries, kiwis, broccoli, peppers, blueberries, and raspberries.

Vitamin E is present in seeds and nuts: walnuts, almonds, hazelnuts, sunflower seeds, etc. It's generally better to eat nuts raw, but in nutrition, there are no "bad" or "good" foods; it's about considering the individual context. In this case, roasted nuts are recommended because roasting increases the availability of vitamin E. Additionally, since roasted nuts usually contain added salt, that will encourage us to drink water and help with hydration, supporting the rehydration process discussed earlier.

## Glutamine

Glutamine is a supplement that helps restore muscle damage and supports the immune system, as both are typically affected after races of this magnitude. It helps in the recovery of muscles, tendons, and cartilage that have been damaged during intense physical exertion.

We at Nutriexper, experts in sports nutrition (@nutriexper), hope these tips are useful to help you tackle the competition with the best possible preparation. We'd love to hear your thoughts and experiences, and we look forward to seeing you in Ibiza this April.

The countdown begins now!

If you want more information or an individualized plan, you can contact us via email at info@nutriexper.com (nutriexper.com).

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