Performing measurements with the Bioelectrical Impedance Analyzer to measure body composition

Time periode:
beginning of the project, after 6 months, after 12 months

The number included in the measurements:
50% athletes in the project

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How does BIA technology work?

Bioelectrical Impedance Analysis is a technique used for estimating body composition. All TANITA body composition monitors use advanced Bioelectrical Impedance Analysis technology. When you stand on a TANITA monitor, a very low, safe electrical signal is sent from four metal electrodes through your feet to your legs and abdomen to produce whole body composition measurements. In segmental models, the four hand-held electrodes will provide extra readings for each leg, arm and abdominal area. The electrical signal passes quickly through water that is present in hydrated muscle tissue but meets resistance when it hits fat tissue. This resistance, known as impedance, is measured and input into scientifically validated TANITA equations to calculate body composition measurements in under 20 seconds.
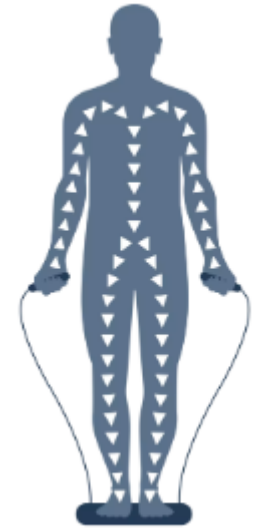
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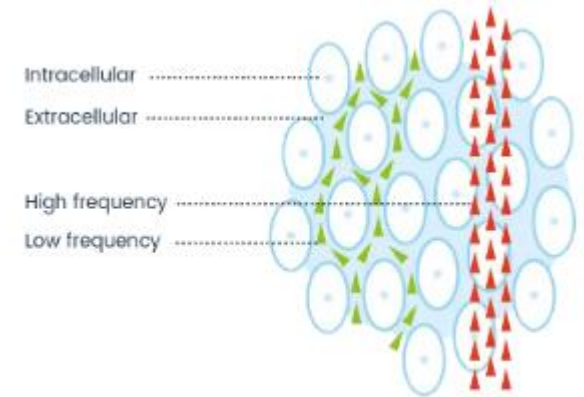
Multi frequency BIA technology

Multi-Frequency Monitors are able to measure bioelectrical impedance analysis at three or six different frequencies. The additional frequencies provide an exceptional level of accuracy compared to single and dual frequency monitors. The lower frequencies measure the impedance external to the cell membrane. The higher frequencies are able to penetrate the cell membrane.

By measuring impedance at both the lower and higher frequencies it is possible to estimate extracellular water (ECW), intracellular water (ICW) and Total Body Water.

This information is essential for providing the health status of a person and indicating health risks such as severe dehydration or oedema

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11 Team

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Understanding your measurements

Body fat mass and percentage

The body fat mass is the weight of fat in your body. The body fat percentage is the weight of the body fat mass in relation to the total body weight.

Body fat fulfills important functions, such as keeping your body warm or protecting your organs. It's important, but an excess or shortage of fat is counterproductive for your health. A high percentage of fat can lead to lifestyle diseases such as type 2 diabetes or obesity, while a low percentage of fat can lead to osteoporosis, irregular menstruation or loss of bone mass. Our body analysis scale helps measure body fat percentage, by calculating your body fat in relation to your total body weight. A too low percentage means you probably need to make changes to your diet and exercise regime to increase your fat mass to a more healthy level, while a high percentage means you could benefit from more exercise and a healthier diet.

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Understanding your measurements

Segmental body fat percentage

Measurement of body fat percentage per part of the body.

By measuring the variation in fat percentages in both arms, both legs and your torso separately, you can specifically monitor the effectiveness of your efforts and make adjustments where necessary. You can easily measure this with TANITA's unique segmental body analysis scales.

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Understanding your measurements

Visceral fat

Visceral fat is found deep in the core of the abdomen. This fat surrounds and protects vital organs, such as the liver, pancreas and kidneys.

Visceral fat is on the inside of the muscle wall in the body's trunk and protects vital organs. Visceral fat is not visible on the outside of the body and you cannot squeeze it. In addition to a healthy overall body fat percentage, it is important to keep a close eye on the amount of visceral fat. Especially as you get older. Too much visceral fat can lead to serious health problems, such as cardiovascular disease, type 2 diabetes or hypertension. Our body analysis scales provide insight into the amount of visceral fat.

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Understanding your measurements

Muscle mass

The predicted weight of muscle in your body.

Muscle mass includes skeletal muscle, smooth muscle (such as heart and digestive muscles) and the water in your muscles. Muscles act as the engine for your energy expenditure. As your muscle mass increases, the rate at which you burn energy (calories) increases. This speeds up your basal metabolic rate (BMR) and helps to reduce excess body fat. This is how you lose weight in a healthy way.

A high muscle mass can reduce the risk of developing diabetes in adulthood. More skeletal muscle mass means more insulin receptor sites, which help with the uptake and regulation of glucose (sugar) deposited in the bloodstream after eating. 80% of glucose uptake takes place in skeletal muscle. The more skeletal muscle mass there is, the easier it is for the body to regulate insulin levels and minimise excess fat.

In the elderly, muscle mass is particularly important for maintaining mobility, supporting the joints and maintaining good balance, thereby helping to minimise the risk of falls and fractures. A good or high level of muscle mass is an important indicator of longevity.

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Understanding your measurements

Segmental muscle mass

Amount of muscle mass per body part.
The unique segmental body analysis scales allow you to measure muscle mass by body part (segment). This is especially useful for anyone who is monitoring the balance of the left and right side of the body or trying to build muscle mass within a certain part of the body.

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Total body water (%)

The body water percentage is the amount of fluid in the body, expressed as a percentage of the total body weight. Water plays an important role in various body processes and is found in every cell, tissue and organ. A healthy body water percentage for women is between 45% and 60%. For men, it is between 50% and 65%. A healthy body fluid percentage reduces the risk of health problems and ensures that the body functions properly. The body's water content is constantly changing. Water is lost through urine, sweat and breathing, but your hydration level can also vary depending on, for example, alcohol consumption, the flu or menstruation.
The total percentage of bodily fluids decreases as the percentage of body fat increases. A person with a high body fat percentage may fall below the average body water percentage. Please note that your body water measurement should be used as a guideline and not to determine specifically your recommended Body Water Percentage. If you have any questions, always consult an expert such as your doctor.

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Understanding your measurements

Bone mass

Healthy bones and a healthy bone mass are important for your body's strength, movement and load. This is necessary because you have an increase in bone mass up until the age of 30. After this age, the bone mass will slowly decrease. This does not immediately lead to problems, especially if you take care of a good balance in your body. Although it is unlikely that your bone mass will change within a short period of time, you would do well to check this with some regularity. The body analysis scale calculates your bone mass within seconds. This is done using a statistical calculation based on existing studies. These studies have shown that there is a close correlation between the weight of your bones and your lean mass.

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Understanding your measurements

Body type

Assesses the percentage of muscle and body fat. This is then classified into one of the nine body types.

When you exercise more, your body weight does not necessarily change much. However, the balance between your body fat and your muscles can change, resulting in a possible change in your posture. Body analysis scales allow you to monitor these ratios and changes closely, so that you can move step by step towards your desired physique. The Tanita body composition scale provides an indication of your body type by comparing measurements of your muscle mass and body fat.

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Understanding your measurements

Basal Metabolic Rate (BMR)

BMR (Basal Metabolic Rate) is the minimum amount of energy or calories your body requires daily to function effectively when at rest. This includes sleep. Basal Metabolic Rate (BMR) is the daily minimum level of energy or calories your body requires when resting, for your respiratory and circulatory organs, neural system, liver, kidneys, and other organs to function effectively. Your BMR is strongly influenced by the amount of muscle you have. Increasing muscle mass increases your BMR, which increases the number of calories consumed and subsequently decreases the amount of body fat. On the other hand, a lower BMR will make it harder to lose body fat. If you consume fewer calories than you burn, you will lose weight; and vice versa.

The BMR can therefore be used to determine your minimum calorie intake, which can be built up based on the activities during the day. Your BMR score can be easily determined using a body analysis scale. If you follow an intensive training schedule, we recommend that you measure your BMR score regularly.

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Understanding your measurements

Metabolic age

Your metabolic age compares your BMR with the average of your age group.

The metabolic age is the result of the comparison between your BMR and your chronological age group. If your metabolic age is higher than your actual age, this may indicate that your metabolism is not as efficient as it could be. You can check this with a body analysis scale. By exercising more you can improve your muscle growth, which will benefit your BMR. A regular check-up is essential here.

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Body Mass Index

A standardised ratio of weight to height, used as a general indicator of health.

The Body Mass Index (BMI) is a widely used health indicator. It can be roughly calculated by dividing your body weight (in kilograms) by your height (in metres) squared. If the resulting figure is less than 18.5, you are underweight. A number between 18.5 and 25 indicates a healthy weight. A number above 25 is overweight and a number above 30 is obese. Although the BMI is a generally accepted health indicator, it is not the only one. For example, someone with a lot of muscle mass can have a high BMI without being unhealthy. By looking at the ratio of muscle to fat mass, among other things, you get a much better understanding of your health.

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Understanding your measurements

Daily calorie intake (DCI)

An estimate of how many calories you can consume within the next 24 hours to maintain your current weight.

Whereas basal metabolic rate (BMR) is about the number of calories your body needs daily to function effectively when at rest, DCI also includes the number of calories you need to function effectively during your daily activities. Thus, to calculate your daily energy requirements, two aspects are considered:

Basal Metabolism (BMR): the energy your body needs to maintain basic body functions such as breathing, heart rate and temperature regulation, and your Energy for Activity: the energy your body needs to move, depending on your physical activity level.

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