



boditrax
precision body composition



FAQs



I. Frequently asked questions

Q. How is BMR calculated by boditrax composition monitors?

The electrical signals do not directly measure BMR. They measure electrical impedance, and from this, the weight measurement, and the other pre-programmed information, they use medically validated equations to make the various calculations.

The first calculation is body water, from this the equations go on to calculate muscle mass, and then to calculate fat free mass (not shown on consumer models), then fat mass and fat %. Once this information is obtained, the BMR calculation is based on the amount of muscle.

Q. How accurate is boditrax?

The weight readings are accurate to within +/- 0.1kg. The Body Fat % readings are within 5% of DEXA, which is a gold standard for measuring Body Fat.

Q. Is boditrax safe to use if I am pregnant?

boditrax is perfectly safe for mother and baby. However, due to the changes in the mothers' body (hormone levels, changes in water content) during pregnancy, the Body Fat readings should not be interpreted as completely accurate. It is therefore not recommended to scan during pregnancy.

Q: Should I use boditrax if I have a heart pacemaker or other medical implant fitted?

boditrax uses BIA (Bioelectrical Impedance Analysis), which involves sending a very low voltage electrical signal through the body. There is a risk that this signal could cause a pacemaker or other implanted medical device to malfunction.

Q: Who has carried out the research used by boditrax?

All research used by boditrax has been conducted under strict medical conditions. It is prepared by medical experts who are at the cutting-edge of their field to test and validate the equipment and equations used by boditrax.

As part of boditrax mission to remain at the cutting edge of medical related technology and health issues, boditrax utilises information from the Tanita Medical Advisory Board (TMAB).

TMAB consists of the senior researchers and obesity specialists from around the world. The purpose of the board is to acting in a medical advisory capacity in the following areas:

To recommend and oversee research pertaining to products used by boditrax. This includes clinical trials, outcome studies and validations. To identify new areas of research appropriate to boditrax products.

To provide medical and scientific data necessary to the improvement of current products and marketing as well as assist with the development and testing of new health monitoring products.

To be available as experts on the subjects of obesity, body composition, BIA and specific boditrax products To review science and medicine related marketing and product materials for accuracy prior to production and distribution.

To be active participants in body composition or health symposia produced or sponsored for use by boditrax.

To assist with the refinement and development of health related products in various roles as necessary and appropriate.

Q: My body fat percentage is not within the healthy range – Is this bad?

The ideal proportion of body fat varies according to gender, age and body type. Biologically, women should have more body fat than men. As we get older, our body fat percentage will also increase slightly.

To see at a glance what levels of body fat are healthy please refer to the healthy ranges chart. This information has been clinically validated and is based on NIH/ World Health Organisation BMI guidelines.

If your fat percentage is too high try making small adjustments to your lifestyle and diet. Cut down a little on dietary fats and eat lots of healthy fruit and vegetables. At the same time increase the amount of exercise you do. This will help you to achieve long lasting changes in your life. Expect the fat percentage to go down slowly - and stay down! If you are concerned about your body fat you should consult a doctor before starting an exercise regime.

Q: No matter how much water I drink I never seem to have have the right hydration

boditrax relies on the body's electrical conductivity, which in turn relies on the body's fluid levels. Fat tissue is anhydrous and resists an electrical signal, while muscle tissue is relatively hydrated and conducts an electrical signal. However, factors such as temperature, how much exercise you have done, when you last had a drink, medical conditions (including menstruation), medications, alcohol, caffeine etc., can also affect the hydration level of a

person's muscle tissue, which can then affect the body fat reading. The time of day can also affect hydration levels, as well as fluid distribution in the body. It is for this reason that boditrax recommends that readings are most consistent when taken between 5 and 7 pm before the evening meal. If your body fat % is not within the healthy range it will be impossible to obtain the 50-55% hydration levels.

Q: boditrax weighs me but won't give my fat readings

To obtain a Body Fat % reading, the electrical signal must pass through the body. If you are wearing socks or tights (even very thin tights) the signal will receive excessive resistance and may not give out a reading. Also, severe calluses or hard skin on the soles of the feet can affect the reading. The body fat monitor cannot detect body fat of less than 3%.

Q: I sometimes get different weight readings from other scales – Is boditrax out of calibration?

boditrax equipment has a very low rate of returns of faulty products (less than 1%). Often it turns out that when tested with calibrated weights it is the boditrax scale that is correct and the others that are faulty! The only way to be sure is to test the scale with a calibrated weight.

Q: Why do I get different body fat percentage readings on the same day?

The weight of fat in a person's body is unlikely to change by a large amount during the course of a day: In the same way that the bones and internal organs do not change. However, the weight of a person's body is constantly changing as food and water is taken in and passed out.

In addition, a person's hydration status is changing constantly - this is water contained not in the stomach, but in the muscle tissue where it is needed for the body to function. So why does the body fat % change? It is important to remember that the reading shows the % of your total weight that is fat, not the actual WEIGHT of fat. So, mathematically, if your total weight goes up because you have more water in your body, the percentage of your weight that is fat will be lower even though the actual weight of fat has not changed.

Conversely, if you are dehydrated, your total weight will be lower giving a higher % of fat. This is easier to see with scales that show total body water because as the water % increases the fat % decreases and vice versa.

Please bear in mind that the body fat monitor calculates the water, muscle, and bone as the first part of the equation, and then subtracts this from the total weight - the rest being fat. If you "cheat" the scales by standing on them with a pile of books it will give a (incorrect) higher fat reading. In the same way having a very full stomach, or anything that increases the weight abnormally will give an incorrect reading.

Q: What is athlete mode and how do I qualify?

The points below will categorise whether you should use athlete mode or not.

People who do large amounts of aerobic exercise will have different body types to those who don't. Their hydration levels will be different, and the composition of their muscle tissue may differ too. If such individuals use the Standard boditrax setting, their reading may well be overestimated. The Athlete mode in several models of boditrax takes into account these differences to give a more accurate measurement of body fat % in such individuals.

People often ask - "Am I an athlete?" The answer is that there is no exact point at which a person becomes an athlete. As a guide, if someone is doing more than 10 hours a week vigorous exercise, and has a resting heart rate of under 60 beats a minute they should use the Athlete mode. The same could apply to a person who is currently doing less exercise, but who has had a "lifetime of fitness" (e.g. an ex international rugby player.)

Children who are also athletes should interpret results with care. The calculations rely on an estimation of "average" bone development and other body composition factors. In children these body composition factors can vary widely depending on physical maturity and the readings may not represent an absolute picture of the body fat %. However, the readings for any individual will remain constant over a period of time and the scales can be reliably used to measure changes in body fat.

Q: Are there optimal conditions for determining body fat percentage using boditrax?

Yes, these are as follows:

Select a consistent time of day, and stick to it. With an empty bladder. When normally hydrated (generally between 5-7pm before evening meal). Unclean footpads may interfere with conductivity.

Nylons interfere with conductivity. If it is absolutely necessary to measure in nylons, use a drop of isopropyl (rubbing) alcohol on the footpads to act as a conductor.

Things that can affect hydration include: Strenuous exercise. Recent food intake. Diuretics such as caffeine, alcohol, certain medications. Early morning is not recommended because the body is often dehydrated after a night's sleep. Once you have established your baseline, boditrax recommends monitoring body fat about twice a month. Checking body fat more frequently is not beneficial as changes occur slowly over time.

Q: What are the body fat guidelines for children?

Despite the rise in childhood obesity levels there are currently no healthy body fat ranges for children. The fact is it is difficult to establish such ranges for children.

Firstly, as every child's development is different, as their bodies change dramatically and rapidly throughout adolescence, it is not practical to concoct a "one-size-fits-all" range for children.

Secondly, because the clinical methods used to get reference data for body fat analysis involve exposing the body to low doses of X-ray radiation; there are particular ethical problems in doing this on children. This means that there is a lack of appropriate clinical research for boditrax to base its methods on.

Thirdly, even international bodies such as the World Health Organisation do not give clear-cut healthy weight ranges for children. There are no international standards even for 'height/weight' ranges.

Establishing healthy body fat ranges for children is a research priority for us, and we will publish more information when this becomes available.

Q: I have had a sex change – Should I use the male or female settings?

There is no definitive answer for this question. The equations used in the male and female settings are very different as men and women, on average, have different amounts of fat in their bodies.

The general rule is that you should stick to the gender setting that you were born with, as this will give the most accurate and repeatable results for your gender.

Q: Why is boditrax not measuring water for my child?

Currently the boditrax setting 'Total Body Water' will not measure Body Water in Children, as there are no published guidelines for Children. Research to date has concentrated on developing accurate equations for adults.

As medical research continues, equations suitable for children's bodies will be developed. As a responsible company boditrax will not show readings for children on the scales until the relevant background medical research has been done.

Q: Is it possible to have too little body fat?

Yes. Both extremes - too much or too little body fat put an individual at risk for serious medical and/or psychological conditions. Having a very low body fat percentage, particularly for women, can result in musculoskeletal problems and osteoporosis. And it can upset the hormonal balance causing loss of menstruation. Striving for extremely low body fat can also result in severe eating disorders, such as anorexia nervosa, bulimia, and binge eating; which have significant health implications. Too much body fat is also linked to Type 2 Diabetes, Heart Disease, Stroke and certain cancers.

Q: Are there any illnesses directly linked to obesity?

Obesity is directly linked with Diabetes Type II and hypertension, and is a contributing risk factor for many other conditions including heart disease, sleep disorders, arthritis, gall bladder disease, stroke, and several forms of cancer. Awareness and monitoring of body fat percentage can be a motivational tool for a fitness or weight management program. Additionally, with any chronic degenerative disease, monitoring body fat and lean body mass is critical to evaluation, treatment, and management of the condition. This information is helpful in determining a suitable exercise and nutritional program on an individual basis.

Q: How does boditrax bia compare with other methods in terms of accuracy, repeatability convenience and length of procedure?

DEXA (Dual Energy X-ray Absorptiometry).

This method is very accurate and repeatable, but involves extremely expensive equipment and is generally 20-30 minutes while every section of their body is systematically X-rayed. This method is used mainly in research studies.

Hydrostatic Weighing (Dunk Tank).

Done correctly, this method is also quite accurate, and the results are often repeatable. However, the test is somewhat subjective because it relies upon the subject's ability to expel all oxygen from their lungs while submerged in a tank of water. Oxygen remaining in the lungs will skew the results. This method is considerably inconvenient to the user. The 'tank' is also expensive, depending on the type of equipment used and the underwater facility. In clinical settings, this procedure is repeated a number of times, and an average is taken. Because of the expense, lengthy testing process, and physical burden to the subject, this method is more suitable for research studies.

Conventional BIA.

Conventional Bioelectrical Impedance Analysis methods are accurate, but more subjective based on the placement of electrodes (a 1cm electrode variation on any limb dramatically changes the reading); therefore trending results may not be accurate. The user lies down while electrodes and conductive jelly are placed on a wrist and opposite ankle. Although this procedure can be performed in some physician's offices, it is neither as convenient nor objective as the boditrax BIA method.

Fat Calipers

Fat Calipers measure skin folds of subcutaneous fat and apply these measurements to a formula to calculate overall body fat percentage. Although widely used fat calipers show considerable variation in measurement based on the skill and experience of the person administering the test and the accurate selection of measuring points. The test is also highly intrusive, requiring users to remove most of their clothes and a level of physical contact with the practitioner.

boditrax K780 – How it works.

boditrax body composition uses Bio-Electrical Impedance Analysis (BIA). This technology was pioneered more than twenty years ago and boditrax and its technology partners continue to innovate and lead the field in the development of deliverable super precision body composition. boditrax BIA offers an excellent combination of accuracy, repeatability, affordability and ease of use.

BIA is based on the principle that different materials exhibit different properties when electricity is passed through them – in everyday life we can see this in the cables we use at home or in the workplace; the inner part of the cable (usually copper) is a good conductor of electricity and carries it to the appliance. The outer part of the cable (usually plastic) is a very poor conductor of electricity and resists or impedes the current and prevents us from being harmed. This electrical resistance or impedance can be measured and expressed in Ohms (Ω).

The different components of the human body also have differing electrical properties. Lean, well hydrated muscle contains high levels of water and electrolytes, giving relatively low impedance whereas fat mass is comparatively anhydrous and acts as a resistor to the flow of electricity giving a relatively higher impedance.

By passing a very low, safe electrical current through the body, boditrax is able to measure the strength and speed of the return signals and, based on impedance, calculate the proportions of the tissues that signal has travelled through. The signal is up to 90 μ A and for comparison a standard UK power outlet can provide over 140,000 times this current. It is completely safe and is not perceptible to the subject.* These measurements are then combined with additional data including the user's height, weight, gender, body type and age as well as a massive database of medically validated research to calculate their body composition.

Because it uses multiple electrodes, the boditrax K780 Monitor is also able provide segmental analysis as it can isolate and compare the impedance of different parts of the body (Trunk / Left Arm / Right Arm / Left Leg / Right Leg). This allows the display of muscle and fat content for each of these parts which is of particular interest to elite sports persons and physiotherapy / rehabilitation patients as well as general fitness users.

To improve accuracy, the boditrax K780 Monitor also uses multiple frequencies of electricity (5 kHz/ 50kHz

/ 250kHz). Different frequencies approach tissues and cells at differing angles with some unable to penetrate the cell walls while others pass through. Further cross calculations ensure reduced sensitivity to hydration levels and permit the measurement of phase angle as a further input variable.

Once a scan is taken the data is instantly passed over the internet to the secure boditrax cloud database. This means that results can be viewed by the user from any internet connected device including laptops and tablets. Storing multiple scans also allows users to monitor their

progress over a period of time while fitness professionals can evaluate the effectiveness of their programs.

boditrax software also allows users and facilities to interact with their data for example by setting goals and customizing their experience in terms of content, look and preferred units. Because boditrax unique body composition software is also cloud hosted, data is securely held off site and both users and facilities benefit from new features as they are released.

* WARNING - This equipment must not be used on subjects with pacemakers or other mechanical implants.

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