

# Our measures for health

seca Body Composition is the result of many years of dedicated collaboration of leading experts from both, medical and body composition research. That's why behind each measuring parameter stands a validation against the medical gold standard, as proven by a comprehensive and transparent study.

From Body Score to BIVA chart: seca parameters provide you with everything you need to effectively support your patients. The parameters offer a wide range of options for interpreting the body composition, no matter if you are a BIA beginner or expert. Do you want to view muscle mass in relation to BMI, age, as an index or even according to DXA validation? Do you only want to employ base parameters like skeletal muscle mass and fat mass or include phase angle, body-composition-chart and visceral fat for a more sophisticated assessment?

It is up to you and your patient's health and fitness goals.

## The measurement parameters:

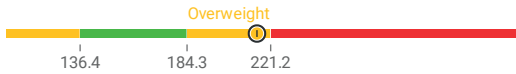
- 01 Weight
- 02 Body Mass Index – BMI
- 03 Fat Mass Index – FMI
- 04 Fat Mass Percentage – FM %
- 05 Fat-Free Mass Index – FFMI
- 06 Skeletal Muscle Mass – SMM
- 07 Skeletal Muscle Index by MRI – SMI
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## 01 Weight

### Weight

↘ 215.3 lbs



BMI  
29.2 kg/m<sup>2</sup>

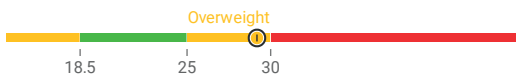
When height is measured as well, this can be used to calculate body mass index (BMI) which can give an initial assessment of a person's nutritional status.

Weight alone is not a risk factor for diabetes or cardiovascular disease. Weight can not properly evaluate an individual's health status.

## 02 Body Mass Index – BMI

### Body Mass Index - BMI

↘ 29.2 kg/m<sup>2</sup>



Weight: 215.3 lbs  
Height: 6 ft

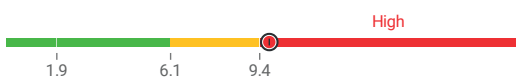
A person's state of nutrition is initially assessed by measuring and weighing the subject. Body Mass Index (BMI) indicates the **ratio between a person's weight and height**.

The more accurately weight and height are measured, the more accurate BMI will be. BMI does not allow any conclusions to be drawn about body composition or the distribution of muscle, fat and water in the body.

## 03 Fat Mass Index – FMI

### Fat Mass Index - FMI

↗ 9.8 kg/m<sup>2</sup>



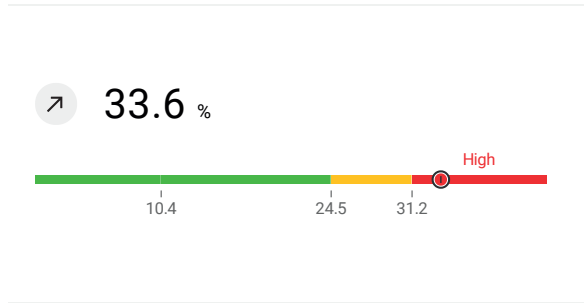
Fat Mass: 72.3 lbs  
Fat Mass Percentage (FM%): 33.6 %

Fat Mass Index indicates the **proportion of fat mass relative to body weight**.

To compensate for the inadequacy of BMI, fat mass needs to be considered in addition to muscle mass. The normal values of percentage-based fat mass are based on BMI, as fat mass, not weight, is the risk factor for diabetes or cardiovascular disease. Combining this with the figure for visceral adipose tissue thus allows a risk assessment to be performed, with values in the green area representing the lowest risk and values in the red representing the highest risk.

## 04 Fat Mass Percentage – FM %

### Fat Mass Percentage - FM %



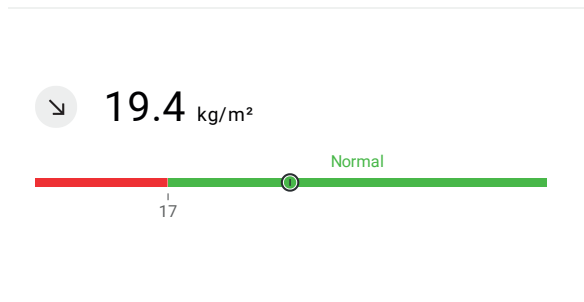
Fat Mass: 72.3 lbs  
Fat Mass Index (FMI): 9.8 kg/m<sup>2</sup>

Percentage-based fat mass indicates the **proportion of fat mass making up body weight**.

To compensate for the inadequacy of BMI, fat mass needs to be considered in addition to muscle mass. The normal values of percentage-based fat mass are based on BMI, as fat mass, not weight, is the risk factor for diabetes or cardiovascular disease. Combining this with the figure for visceral adipose tissue thus allows a risk assessment to be performed, with values in the green area representing the lowest risk and values in the red representing the highest risk.

## 05 Fat-Free Mass Index – FFMI

### Fat-Free Mass Index - FFMI



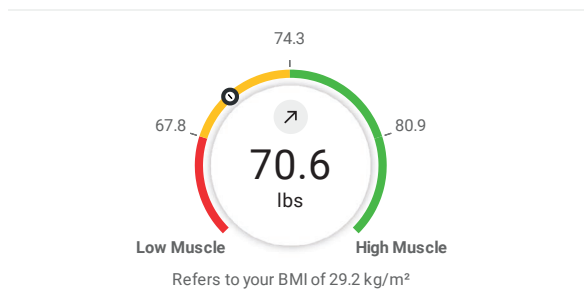
Fat-Free Mass:  
143 lbs  
(66.4 %)

Fat-Free Mass **refers to everything in the body which is not fat mass**. Water, muscle, and bone have the highest proportion of fat-free mass. This index is calculated like Body Mass Index (BMI).

FFMI is used to diagnose malnutrition or a lack of muscle. In combination with other parameters, measured values in the red area indicate such disease.

## 06 Skeletal Muscle Mass – SMM

### Skeletal Muscle Mass - SMM



Skeletal Muscle Mass Percentage:  
32.8 %

The skeletal muscles are the muscles which are used actively to move the body. Skeletal Muscle Mass is the **weight of all the skeletal muscles in the arms, legs and torso**.

This value allows a statement to be made about the ratio of fat to muscle. All the skeletal muscles of the patient are compared to those of people of the same ethnicity, gender, age and BMI. Measurements on the left-hand side mean an unfavorable ratio of fat to muscle. Measurements on the right-hand side mean a favorable ratio of fat to muscle.

## 07 Skeletal Muscle Index by MRI – SMI

### Skeletal Muscle Index by MRI - SMI

→ 9.6 kg/m<sup>2</sup>



Skeletal Muscle Mass:  
70.6 lbs

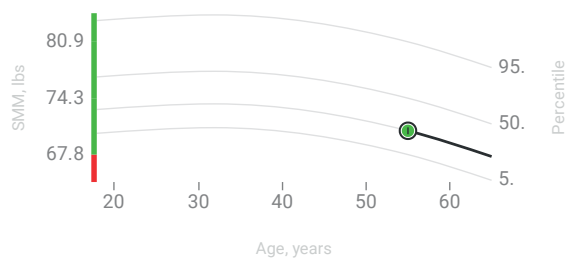
Skeletal Muscle Mass is the sum of all the muscles in the body which are used actively to move it. Skeletal Muscle Mass is thus the weight of all the skeletal muscles in the arms, legs and torso. Skeletal Muscle Index (SMI) indicates the **ratio between a person's Skeletal Muscle Mass and height**.

SMI is used to diagnose malnutrition or lack of muscle. In combination with other parameters, measured values in the red area indicate such disease.

## 08 Skeletal Muscle Mass over Age – SMM

### Skeletal Muscle Mass over Age - SMM

↗ 70.6 lbs 17. Percentile

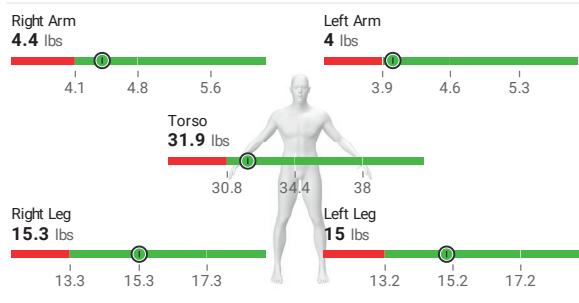


The skeletal muscles are the muscles which are used actively to move the body. Skeletal Muscle Mass expressed in pounds or kilograms is thus the weight of all the skeletal muscles in the arms, legs and torso.

This value allows a statement to be made about the ratio of fat to muscle. It **indicates at a glance whether a person has too little muscle (red area) for his or her gender, weight, height and age**. Muscle mass is lost over the course of a lifetime, so the aim is to maintain muscle.

## 09 Segmental Skeletal Muscle Mass

### Segmental Skeletal Muscle Mass



Total Skeletal Muscle Mass:  
70.6 lbs

Segmental Skeletal Muscle Mass **indicates muscle mass in the arms, legs and torso**. These values allow symmetrical or poor muscle distribution to be identified, enabling personalized training programs, as well as individual targets, to be used in such cases.

The red area on the diagram shows a severe lack of muscle in the relevant part of the body.

## 10 Appendicular Skeletal Muscle Index by DXA – ASMI

### Appendicular Skeletal Muscle Index by DXA - ASMI

9.1 kg/m<sup>2</sup>



Skeletal Muscle Mass by DXA is equivalent to lean soft tissue

Appendicular Skeletal Muscle Mass:

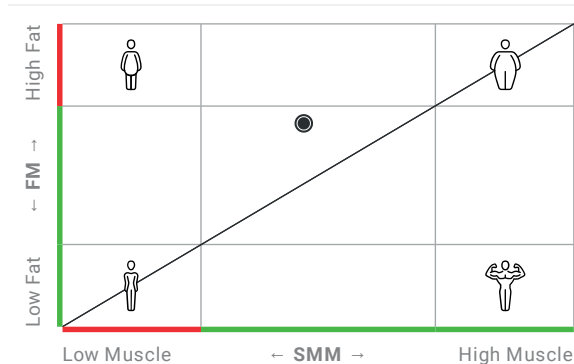
66.9 lbs  
(31.1 %)

**Appendicular lean soft tissue** is used to calculate Appendicular Skeletal Muscle Index. This **includes connective tissue as well as muscle mass and water**. This index is calculated like Body Mass Index (BMI).

ASMI is used to diagnose malnutrition or lack of muscle. In combination with other parameters, measured values in the red area indicate such disease.

## 11 Body Composition Chart – BCC

### Body Composition Chart - BCC



The Body Composition Chart **combines fat mass and skeletal muscle mass in a coordinate system**. A distinction is made here between the 4 types of body composition:

Bottom left: Slender, lean people

Bottom right: Muscular athletes and people who practice a lot of sport

Top right: Active people with obesity

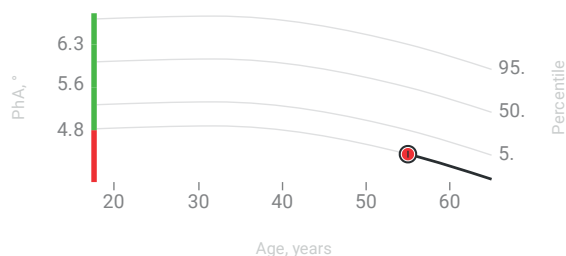
Top left: Passive people with obesity, known as "sarcopenic obesity"

The area in the exact center is the average range.

## 12 Phase Angle – PhA

### Phase Angle - PhA

4.4° 1. Percentile

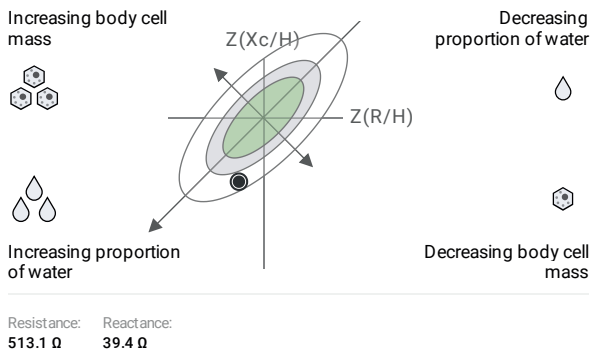


Phase Angle is an established **value which allows statements to be made about cell quality and quantity**. It is frequently used in clinical nutrition and serves as a parameter for diet and function. A healthy and higher muscle mass results in a high phase angle, water retention or inflammation give rise to lower phase angle values.

As phase angle also helps assess function, it is now also used in sports and fitness applications.

## 13 Bioelectric Impedance Vector Analysis – BIVA

### Bioelectric Impedance Vector Analysis - BIVA

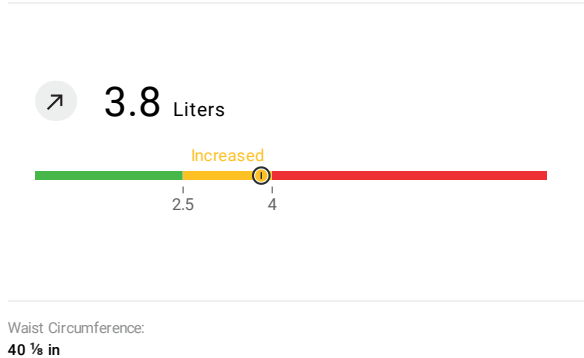


Bioelectrical Impedance Vector Analysis (BIVA) **shows a body cell axis** (lower right to upper left) **and a hydration axis** (upper right to lower left).

Changes on the body cell axis reflect changes in body cell mass (= phase angle). Changes on the hydration axis reflect changes in total body water. The ellipses reflect the reference range of 50 % (green), 75 % (gray) or 95 % (white) of a healthy reference population. This parameter can only be interpreted correctly by an expert in bioimpedance.

## 14 Visceral Adipose Tissue – VAT

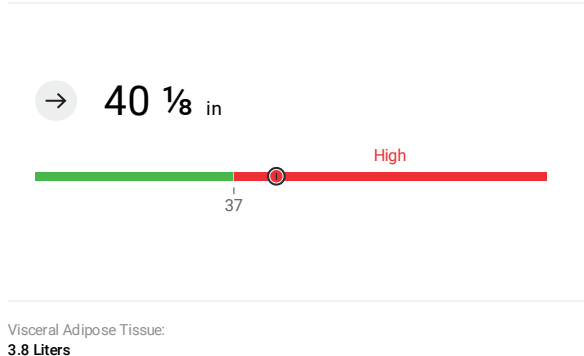
### Visceral Adipose Tissue - VAT



It is not just fat mass alone, but also the distribution of adipose tissue which plays an important role in assessing the risk of diabetes or cardiovascular disease. The visceral adipose tissue **surrounding the abdominal organs**, in particular, has a major influence on the body's resistance to insulin and thus on the development of diabetes. A high level of visceral adipose tissue is therefore a risk factor and should be as low as possible, i.e. in the green area.

## 15 Waist Circumference – WC

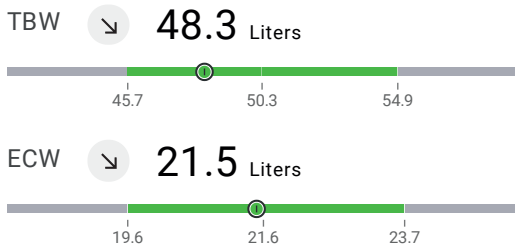
### Waist Circumference - WC



Waist Circumference is a simple measured value which allows visceral adipose tissue to be determined more precisely.

## 16 Water

### Water



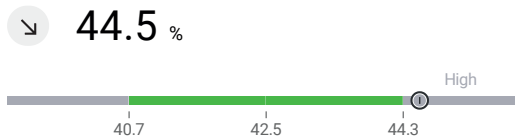
Total Body Water (TBW): 49.1 %  
Extracellular Water (ECW): 21.9 %

Water is the **largest body compartment**. It accounts for some 60% of body weight. Total Body Water (TBW) is divided into Extracellular (ECW) and Intracellular Water (ICW).  $TBW=ECW+ICW$ .

Body composition has a major influence on water values. Deviations in either direction do not necessarily mean hyperhydration or dehydration. In general, such deviations are due to merely to a not entirely typical ratio between fat/muscle.

## 17 Water Ratio – ECW / TBW

### Water Ratio - ECW / TBW



TBW: 48.3 Liters (49.1 %)  
ECW: 21.5 Liters (21.9 %)

Water Ratio describes the **ratio of Extracellular Water (ECW) to Total Body Water (TBW), i.e. hydration**.

Body composition has a major influence on water values. Deviations in either direction do not necessarily mean hyperhydration or dehydration. In general, such deviations are due merely to an irregular ratio between fat/muscle.

## 18 Energy expenditure – REE / TEE

### Energy expenditure - REE / TEE

#### Resting Energy Expenditure - REE

↘ 7.89 MJ/day = 1886 kcal/day

#### Total Energy Expenditure - TEE

→ 11.05 MJ/day = 2641 kcal/day

PAL  
1.4

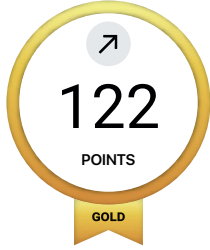
Resting Energy Expenditure (REE) is **energy expended without movement**.

Humans expend as much as 50-75 % of their total required energy just with their brains working, their hearts beating and their lungs breathing. Physical Activity Level (PAL) takes account of energy expended as a result of movement. The higher the level of daily activity, the higher the PAL.

Total Energy Expenditure (TEE) is the **total energy required by the human body**; it is the product of multiplying REE by PAL.

# 19 TRU Body Score

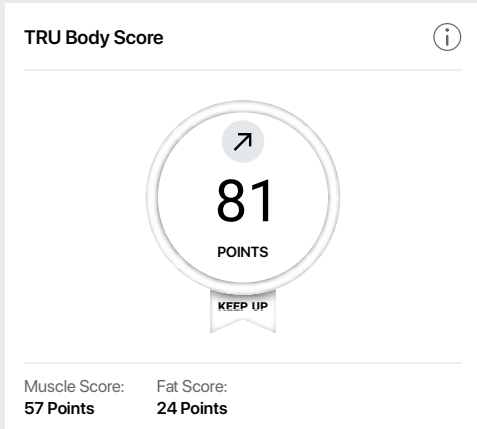
## TRU Body Score



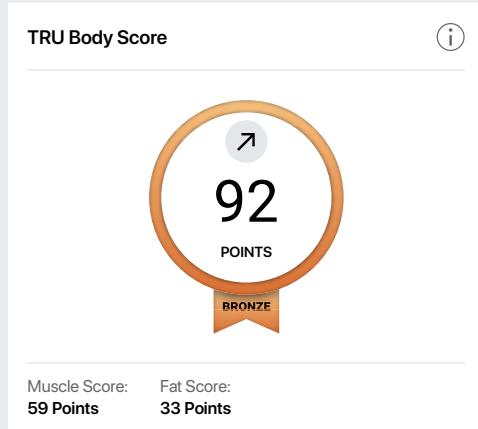
Muscle Score: **86 Points**  
Fat Score: **36 Points**

The TRU Body Score shows body composition at a glance! It **rates muscle mass and proportion of body fat in such a way that you can compare yourself with your reference group**, i.e. other people of the same gender and age.

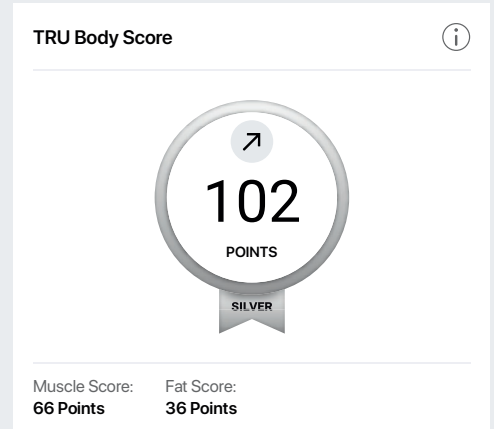
100 points is the average, which means: The white range and bronze show potential upwards, while silver and gold are already above average. Platinum is reserved for a small group: This black range can be reached only with a highly advantageous muscle-to-fat ratio. The TRU Body Score is made up of your Muscle Score and your Fat Score.



Muscle Score: **57 Points**  
Fat Score: **24 Points**



Muscle Score: **59 Points**  
Fat Score: **33 Points**

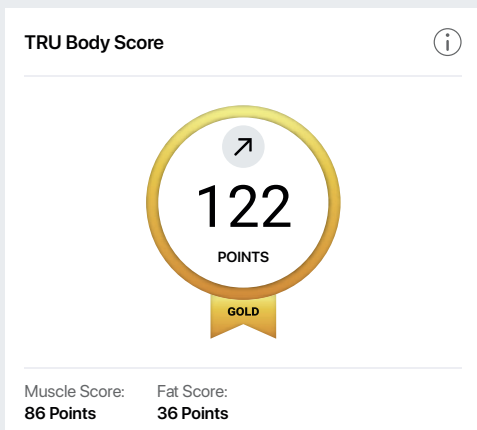


Muscle Score: **66 Points**  
Fat Score: **36 Points**

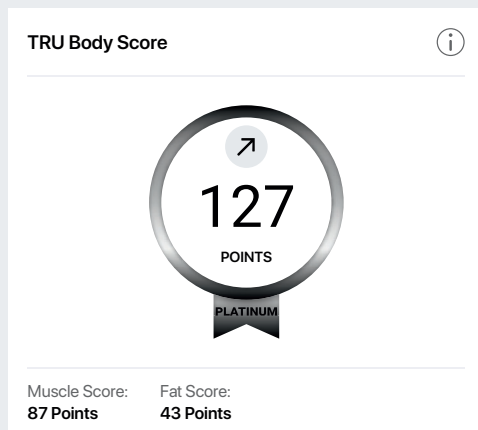
WHITE ≤ 89 Points

BRONZE 90 to 99 Points

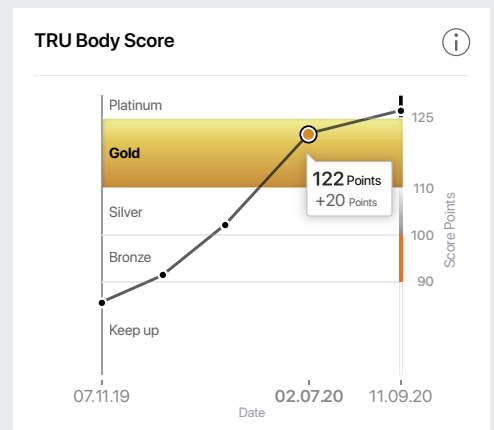
SILVER 100 to 109 Points



Muscle Score: **86 Points**  
Fat Score: **36 Points**



Muscle Score: **87 Points**  
Fat Score: **43 Points**



GOLD 110 to 124 Points

PLATINUM ≥ 125 Points

We reserve the right to make modifications.

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