# **PHASE ANGLE** IN THE SCIENTIFIC EVALUATION

**Test report** no. 43/209/1-16/23-RSNH-1-1 to investigate the change in phase angle over a period of 4 years

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# Investigation of the change in phase angle over a period of four years, combined with a double-blind study

Investigation report of the ISGM, NR. 43/209/1-16/23-RSNH-1-1, 24.6.2023

#### What is the phase angle and how is it measured?

The phase angle is an indicator of cell health. It is measured by BIA impedance analysis. The phase angle is also an important parameter for assessing health, training and nutritional status. It is caused by the distribution of electrical charges in muscle and organ cells - i.e. cell membranes and mitochondria - and the ratio of intracellular and extracellular water.

It manifests itself in a shift between current and voltage - the so-called phase shift. The greater the phase angle, the more resistant and healthier the cell membranes are. This in turn is important for a good exchange of substances across this very cell membrane and therefore says a lot about a person's health and ability to regenerate.



### Phase angle up

- Increase in muscle mass
- Good nutrient supply
- Reduction of water retention (edema)
- Good regeneration
- Improvement of the immune system
- Increase in vitality

Phase angle down

- Decrease in muscle mass
- Malnutrition
- Overhydration of the extracellular space
- Overtraining
- Membrane damage
- Infections, poisoning, stress

The ISGM audit report states in excerpts:

#### Aim of the investigation

The aim is to show that a continuous increase in the phase angle (BIA impedance analysis) occurs over a defined period of time with selected accompanying measures. The data was determined individually for each test subject and presented as a mean value for the group.

#### Test subjects

A total of 397 active female athletes took part in the study. [...]

#### Design

All female athletes took part in four measurements per year over the course of the study period (five [calendar] years/four seasons). All values of the athletes who were able to participate in all measurements were included in the study. The subjects were not informed about the purpose of the study. It was only known that values for regeneration were measured. The test subjects were assigned to the study groups. Randomization was carried out according to Essing (1996).

#### Measuring instruments / tools

The BIAmed Impedance (Tomzcak) systems used to record the data ensure autonomous function tests in accordance with international guidelines. [...]

In view of the number of test subjects and the time taken to collect the data, the data was recorded descriptively with standard deviation and presented as a mean value. [...]

#### Results

The results found in the present study support the hypothesis of an improvement in the phase angle in a defined period of time with suitable accompanying measures.

If we look at comparable studies that show the development of the phase angle with suitable measures (Tomzcak 1986, Rosenberg 2016), it is noticeable that only a maximum period of 12 months was considered. The average results were 0.4 and 0.6% improvement respectively.

The present result of a 10% improvement in the mean value within a period of four years is a result that far exceeds expectations.

If we now consult a bibliography on the presentation of phase angle studies on which this study is based (ISGM Münster 2023), we can draw the following conclusion:

A continuous increase in the phase angle of 10% compared to the initial situation in a defined period of four years results in an "increase in life expectancy, vitality, health and chance of survival in general and with regard to specific indications" (Bibliography ISGM 2023).

The annual improvements of the study group compared to the respective control group show that further positive development is possible even with improved phase angles.

All training and competition loads were periodized and recorded, as were eating habits and nutrient intake. The only difference is hypothetically due to the regular intake of vitalized electrolyte drinks and vitalized water\*.

\*Vitalization was carried out regularly using Vitalizer or Beosigner®.



A larger phase angle stands for better cell health and consequently for an increase in life expectancy, vitality and health in general. As the study shows, drinking the water vitalized with the Beosigner technology or the vitalized electrolyte drinks over a longer period of time led to a significant increase in the phase angle in the test subjects. This in turn suggests a very positive influence on the improvement of the overall state of health and fitness as well as on life expectancy and quality of life.

## PRÜFBERICHT

#### NR. 43/209/1-16/23-RSNH-1-1

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