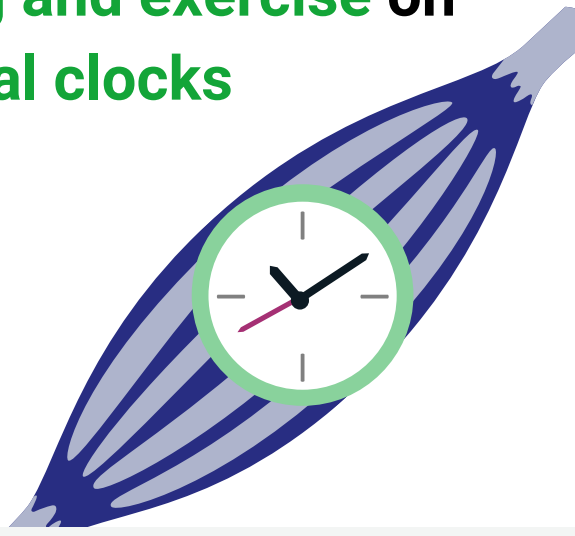
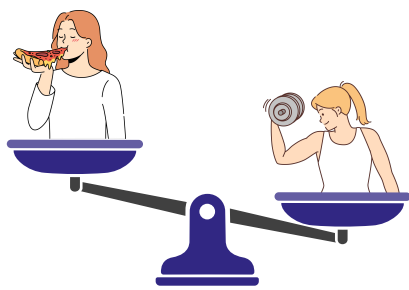


# The influence of eating and exercise on the timing of our internal clocks

A new study shows that the timing of the different clocks in our body depends on multiple stimuli. This was investigated in the **liver-** and **muscle clock** of rats, where only a combination of eating and exercise was able to cause a shift of the internal muscle clock.



Our brain contains a biological clock. The period of this clock is not exactly 24 hours, but it is synchronised by light that enters your eyes. However, there are also similar clocks throughout the rest of our bodies.



## Two signals

These clocks also need to be synchronized. This can happen through signals from the **biological clock** or by measuring the **energy balance**. When you eat or move, your body perceives this and sends signals to the clocks within your body.

When you are active or eat during the night, a **mismatch** occurs between these two signals. This mismatch in your internal clock could be an explanation for the development of **obesity** or **type 2 diabetes**.



Research has examined whether this clock can be reset. This was done by studying the clock in the muscles of rats.

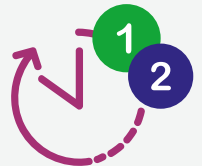


If the rats were active during the day but ate in the evening, the clock **remained on the evening rhythm**. However, when the rats were also fed during the day, the clock in their muscles **shifted to the daytime rhythm**.



The shifting of the clock also had a positive effect on the rats' **body fat percentage** and **weight**.

The timing of the muscle clock is therefore dependent on both the timing of eating and movement. To shift the clocks of different organs, a **combination of stimuli** is necessary.



## Future research

The next step is to investigate when people should ideally eat and exercise. Being active during the day is better for your biological clock, but how can we keep people who work at night healthy?

Click here for more information and the press release



NETHERLANDS  
INSTITUTE  
FOR NEUROSCIENCE  
Master the mind