

# Fasting-TRE

## WHAT IT IS

- Time-restricted eating = TRE (often named intermittent fasting (IF)).
- A set "window" time for food consumption during the day,
- What and when you eat has a significant impact on the body and sets the conditions for certain biological processes, both positively and negatively.

## BENEFITS & BASIS

- Good for targeting fat loss and overall health due to improved sleep that facilitates better recovery and repair of the body.
- Improves the gut microbiome.
- Improves liver health.
- Increases brown adipose tissue (BAT) function.
- Decreases non-alcoholic fatty liver.
- Decreases high cortisol levels.
- In fasting sleep, autophagy occurs (the cleanup and recycling of dead cells) at a healthy level.
- mTOR (mammalian target of rapamycin: a protein enzyme) functions in the regulation of cell growth, metabolism, and autophagy. In a fasted state, mTOR is decreased, which inhibits extreme autophagy to minimize certain health risks.

## CIRCADIAN RHYTHM

- A 24-hour body clock that all cells function on. 80% of genes in the body are on a 24-hour schedule.
- High-low-high clock genes: when high = health benefits. When low = not good.
- Anticipatory signals for digestion are based on it. Food digests better when eaten at the same time each day.
- When to and when not to eat is like viewing sunlight = in the morning is good, and at night is bad.
- Eating and viewing the sun early increases gene expressions, and eating and viewing light late decreases it.
- The liver suffers when you eat around the clock:
  - When you eat often, it increases digestion time, which is bad.
  - When eating times are restricted, it is good because it stabilizes blood sugar and increases BAT function.

## **HORMONE AND MACRONUTRIENT IMPLICATIONS**

- Whenever any food is eaten, blood glucose and insulin rise.
  - Simple sugars create higher spikes.
  - Complex sugars create a moderately high spike.
  - Protein creates a moderate spike.
  - Fat creates a low spike.
- During fasting/non-eating periods, other hormones are released.
  - The release time depends on the hormone.
  - It also takes time for them to decrease.
- Breaking a fast:
  - H<sub>2</sub>O, black coffee, or tea will not.
  - A few peanuts will not be absorbed if eaten hours after the gut is empty.
  - 1 gram of sugar in the middle of a fast will break it.
  - Eating fat in the middle of the window will not break it.
  - Artificial sweeteners – plant-based products like Stevia have a minimal effect on blood glucose levels, but it depends on the type and amount.

## **STUDIES ON TRE, SLEEP, AND OTHER BEHAVIORS**

- 1) Consumed an equal number of calories and performed the same exercise:
  - TRE burned more fat due to increased liver lipase enzyme activity (more breakdown).
  - TRE had fewer CIDEC lipid droplets that inhibit lipolysis (fat breakdown).
- 2) Eating early in the day and protein needed for muscle growth:
  - TRE allowed for better protein synthesis early in the day.
  - Found that waiting one hour after waking before using a TRE window was still effective.
  - Using TRE did not affect hamper strength training workouts performed during the day.
- 3) Increased blood sugar from not using TRE increased the mortality rate in humans & primates.
- 4) MOUSE STUDY: Landmark study on TRE that was the basis of human studies:
  - Group 1 had access to any food anytime in an 8-hour window.
  - Group 2 used TRE but could eat any food = improved health markers and reversed some prior health issues.
  - Group 3 No TRE and ate a high-fat diet anytime = gained weight and got sick.
  - Group 4 used TRE with a high-fat diet = maintained weight.
  - The conventional 8-hour window occurred because the spouse of a researcher did not want the partner to work more than 8 hours.

- 5) Shift workers – anyone on a schedule who remains awake 2+ hours after they should be sleeping.
  - 1 in 5 people are considered shift workers.
  - It negatively affects the circadian rhythm because it may take days to reset it.
  - Most shift workers are prone to disease.
  - Their biomarkers are different and unhealthy due to altered sleep schedules.
- 6) Study on a 4-6 hour eating window:
  - Had many health benefits.
  - No changes in body weight were found.
  - Most subjects over-ate during the 4-6 hours.
  - One meal a day (OMAD) resulted in subjects losing body weight.
- 7) Caffeine & Fire:
  - The advent of fire gave humans the ability to stay up and socialize at night to discuss life, politics, philosophy, etc.
  - Coffee was used as a stimulant to extend the day with more free time.
  - Now coffee is a “morning thing” used to increase alertness.
- 8) The birth of breakfast:
  - Coffee early in the day without food caused gastrointestinal issues, so people ate something early to minimize it.
- 9) Eating window variations:
  - The median number of eating times/day is seven.
  - 10% eat 12x/day.
  - Only 10% eat in a <12-hour window.

## **FAT LOSS CONSIDERATIONS**

- Fat loss is a combination of:
  - TRE.
  - Consuming less CHO.
  - The quantity and quality of total calories consumed.
  - Hormone function.
  - One's age.
  - Non-exercise activity thermogenesis (NEAT).
  - One's daily activity level.

## IDEAL TRE PLAN

- Do not eat until 1 hour after waking.
- Avoid eating within 3 hours before bedtime.
- One is not truly fasting until food is completely digested (up to 5 hours).
- The optimal TRE window is 6 to 10 hours.
- Use the same 24-hour schedule each day.
- If exercising, begin feeding period no more than 3 hours post-workout.
- If adding sleep to the fasting period:
  - Up at 6:00 AM and no food until 7:00 AM (1 hour)
  - Eat from 7:00 AM to 5:00 PM (10-hour window).
  - Fast from 5:00 to 10:00 PM (5 hours).
  - Sleep fast from 10:00 PM to 6:00 AM (8 hours).
- Best schedule for an active social life:
  - Up at 7:00 AM and no food until 10:00 AM (3 hours).
  - Eat from 10:00 AM to 7:00 PM (9-hour window).
  - Fast from 7:00 PM to 10:00 PM (3 hours).
  - Sleep-fast 10:00 PM to 7:00 AM (9 hours)
- How to speed up the fed-to-fasted state:
  - Clear circulating glucose with a post-meal workout.
  - When you stop eating, you are "fed" until the gut clears, then the fasting period begins.
  - Cinnamon, lemon Juice, salty H<sub>2</sub>O, Berberine, & Metformin all clear glucose.

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