

Intermittent Fasting: An ancient adaptation adapted to modern times

Chop breakfast in half with a hatchet (the word, not the plate in front of you) and you get “break” and “fast.” The first meal of the day breaks the fast you have been on since eating your last meal of the day before. If you ate dinner at six o’clock p.m. and your breakfast at 7:00 a.m., you will have ended a 13-hour intermittent fast. That used to be the way most people managed their eating schedules.

Intermittent fasting has recently become one of the world’s most popular health and fitness trends. Eating a heavy meal late in the day and then gulping down a coffee-soaked breakfast early in the morning is not a healthful way to eat. That pattern doesn’t fit the way we are built.

We need to return to an eating pattern where the last meal of one day is followed by a protracted period of food abstinence. How long should that be?

WHAT IS IT

Intermittent fasting is not a weight loss diet, although it may help people lose weight. Instead, it is an eating pattern that cycles between extended periods of food abstinence and eating. Intermittent fasting patterns commonly involve daily 16-hour fasts or full-day fasts of 24 hours, two or three times per week.

The focus of intermittent fasting is not *which* foods are eaten. The regimen centers specifically on *when* foods are eaten. The health benefits of intermittent fasting can be maximized if combined with a grain-free diet of fresh, whole vegetables,

fish, and poultry that avoids sugar and alcohol. Potential benefits can be minimized if the fast and eat cycles occur between meals comprised of processed or fast foods.

HOW IT’S DONE

Here are descriptions of the most common intermittent fasting methods:

- **The 16/8 method:** This involves skipping breakfast and restricting your daily eating period to 8 hours, commonly set at 1:00 –9:00 p.m. You then fast for 16 hours between 9:00 p.m. and 1:00 p.m. The 16/8 method is acceptable for people with normal and efficient metabolism and blood sugar control. Time slots can be shifted back three hours. That means eating occurs from 10:00 a.m. to 6:00 p.m. Fasting then stretches from 6:00 p.m. to 10:00 a.m., the requisite 16 hours, but ceases before fatigue, mental fogginess, and loss of energy are likely to set in.
- **Alternate Day Fasting or Eat-Don’t Eat-Eat:** This involves fasting for 24 hours, once or twice a week. That commonly means one doesn’t eat from dinner one day until dinner the next day.
- **The 5:2 diet:** With this method, one consumes only 500–600 calories on two (non-consecutive) days of the week but eats normally the other 5 days.

All intermittent fasting methods are supposed to reduce a person’s calorie intake. Therefore, all the above methods should lead to weight loss. They may also improve your chances to live a long life. Animal studies confirm that calorie restriction extends lifespan. These benefits are possible as long as the intermittent faster does not overcompensate for the periods of abstinence by eating too much food when it is again allowed.

CELLULAR AND HORMONAL EFFECTS

Here are some adjustments that occur in your body when you fast:

Human Growth Hormone (HGH): Serum levels of human growth hormone increase

during fasting. HGH aids fat loss and increase lean muscle mass. The hormone also helps maintain bone density (as long as it is accompanied by weight-bearing exercise) and skin thickness in aging adults.²

A full one-day or two-day fast is required to optimize HGH production.

- **Insulin:** Insulin levels in the blood drop under all types of fasting, whether of one or more full day (16 hours) or in a simple calorie-restricted (500-600 Calories) pseudo-fast. Insulin is secreted in response to a sudden rise in blood sugar after a meal is eaten. If nothing is eaten, there will be nothing new to convert to blood sugar, eliminating a rise in blood sugar and the consequent rise in insulin. A lower fasting insulin level is a biomarker in favor of longevity, which suggests that fasting, and possibly intermittent fasting, may help extend life span. Lower insulin levels also make stored body fat more accessible, contributing to reductions in body fat.
- **Cellular repair:** Fasted cells are liberated from metabolizing incoming nutrients and biochemicals. They can instead initiate and accelerate cellular repair processes. This includes autophagy, where cells digest and remove old and dysfunctional proteins that build up inside cells.
- **Gene expression:** Intermittent fasting can, over the long term, reduce DNA damage, thereby reducing the risk of mutagenesis and carcinogenesis. But fasting of all sorts affects many biochemical pathways related to cellular growth, metabolism, protection against oxidative stress, and aging.

WEIGHT LOSS

It is most often a desire to lose weight that motivates people to try intermittent fasting. Eating fewer meals instantly creates the opportunity to reduce calorie intake.

Comparison of weight-loss regimens shows that intermittent fasting and alternate-day fasting are equally as effective as standard calorie restriction diets for weight loss and cardioprotection. However, fasting elevates HGH, which can maintain or increase lean muscle mass

“FAST” FACTS

Fasting has been practiced intentionally and unintentionally throughout human history. Ancient hunter-gatherers struggled through seasonal periods of food scarcity even though they were, in general, well-fed over the long term.

Periods of scarcity forced evolutionary adaptation that allowed us to function without food for extended periods of time. In fact, that is the way we are supposed to eat. Fasting from time to time is more natural than perpetually eating 3 meals per day.

while calorie restriction customarily leads to a reduction in both fat tissue and lean (muscle) tissue.⁶

Hormones: In addition to lowering insulin and increasing growth hormone levels, fasting increases the release of the fat-burning hormone nor-epinephrine. It is true fasting—not intermittent fasting or alternate-day fasting—that raises nor-epinephrine and speeds up the metabolic rate.

HEALTH BENEFITS

Looking for the potential benefits of IF and ADF, we find evidence for:

- **Weight loss:** Intermittent fasting can help shed weight and belly fat without meticulous calorie-counting.
- **Lowers insulin:** Lower serum insulin levels remove cellular stress and may help extend lifespan.
- **Insulin resistance:** Intermittent fasting can reduce insulin resistance, lowering blood sugar by 3–6% and fasting insulin levels by 20–31%, which should help protect against type 2 diabetes.⁷

Inflammation: Multiple markers of inflammation, a key driver of many chronic diseases, decrease during intermittent fasting.^{8,9}

Asthma: Asthma symptoms and pulmonary function improve, and oxidative stress and inflammation decline in response to IF dietary intervention in overweight adults with moderate asthma.¹⁰

Heart health: Intermittent fasting reduces “bad” LDL cholesterol, blood triglycerides, inflammatory markers, blood sugar, fasting insulin, and insulin resistance — all risk factors for heart disease, high blood pressure, and obesity.^{11,12}

Cancer: Studies in mice and rats suggest that intermittent fasting may have chemopreventive effects. Rats and mice show physiological changes under IF regimens similar to those seen in humans so it is plausible that the fate of cancer cells in such test animals could be reflected in humans.

Brain health: Intermittent fasting can affect energy production, oxygen radical metabolism, and cellular stress responses in ways that protect brain cells against genetic and environmental factors to which they might otherwise succumb during aging.

Dietary restriction through intermittent fasting can suppress age-related deficits in

learning and memory and can increase the resistance of neurons to degeneration.

Anti-aging: Caloric restriction by 20% to 40% in rodents has been known to slow the rate of aging, increase mean and maximum life-spans, and inhibit the occurrence of many age-associated diseases since the time of Roy Walford’s breakthrough research at UCLA in the 1970s and 1980s.^{16, 17, 18, 19} In fact, yeast, fruit flies, fish, and rodents all enjoy longer, healthier lifespans under calorie-restricted diets.

However, little is known about the influence of short-term repeated fasting on longevity. But the evidence is mounting. For example, the mean life span of Wistar rats raised from weaning and maintained to death increased 83% on an “every-other-day” feeding schedule compared to rats allowed to eat as they wished each day. The rate of aging was retarded in the group fed on alternate days. Significantly, their bodyweight and growth rate were reduced and their duration of growth was 75% longer than the normally fed group. This implies that dietary restriction throughout life improves longevity through retarded development.²⁰ Biochemical adjustments similar to those seen in rats have been documented in human test subjects, indicating that humans may rightly expect similar improvements to lifespan if disciplined enough to follow an intermittent fasting lifestyle.

PUTTING IT ALL TOGETHER

Fasting has been practiced for millennia, but only within the last 50 years have we been able to understand its role in adaptive cellular responses that reduce oxidative damage and inflammation, optimize energy metabolism and bolster cellular protection. In lower species, chronic fasting extends longevity in part by reprogramming metabolic and stress resistance pathways. In rodents, intermittent or periodic fasting protects against diabetes, cancer, heart disease and neurodegeneration, while in humans it helps reduce obesity, hypertension, asthma, and rheumatoid arthritis while reducing the risk of cardiovascular disease and cancer. We can now say fasting has the potential to delay aging and to help prevent and adjunctively treat diseases.²²

CAUTIONS

Children should not participate in intermittent fasting protocols. Those adults or children who are underweight or have a history of eating disorders should not fast without consulting a health professional first.

There is some evidence that intermittent fasting may not be as beneficial for women as it is for men. Alternate day fasting may

adversely affect glucose tolerance in non-obese women but not in non-obese men, for example.²³ Anecdotal reports have also identified some women whose menstrual periods stopped while following an IF regimen, yet returned to normal when they resumed their previous eating patterns. This suggests that women who are trying to conceive should probably not engage in intermittent fasting, nor should pregnant or lactating women. Finally, as with any major lifestyle change, people with serious medical conditions should consult with their physicians prior to implementation.

SOURCES

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