

Molecular Secrets to Healthy Aging Unlocked by Dietary Patterns like Fasting and the Mediterranean Diet

Researchers reviewed how certain [dietary patterns](#) can promote healthy aging by influencing key molecular pathways.



Challenges of Aging Populations

Rising life expectancy rates have increased the global population from three billion in 1950 to over eight billion in 2022. Despite increased lifespans, maintaining an optimal healthspan, defined as the period of life spent in [good health](#), remains a challenge for society.

[Chronological age](#) (CA) is commonly used to assess aging; however, due to individual differences, it may not accurately reflect biological aging. This has led researchers to investigate alternative biological markers that can more accurately measure the aging process.

[Nutritional interventions](#) have emerged as a promising strategy to overcome the challenges associated with aging and potentially improve health outcomes. Thus, it is crucial to explore how diet influences molecular pathways related to aging and develop personalized strategies for healthy aging.

Caloric Restriction and Intermittent Fasting

Caloric restriction involves reducing calorie intake while ensuring adequate nutrition. Recent studies suggest that it improves metabolic health, reduces obesity risk, and delays the development of conditions related to age, like brain atrophy and [muscle loss](#).

For example, one study of 218 non-obese people between 21 and 51 years of age reported that a 25% reduction in calories led to significant weight loss, improved lipid profiles, and a slower rate of biological aging compared to those on a regular diet. However, the long-term effects of CR on health span and [aging](#) remain unclear.

Intermittent fasting involves alternating between periods of fasting and normal eating. In some species, like worms and fruit flies, intermittent fasting interventions can extend lifespans. Furthermore, one study with 60 participants between 48 and 52 years of age who practiced [alternate-day fasting](#) (ADF) over four weeks exhibited improved body composition, cardiovascular health, and a reduced risk of future cardiovascular events.

Long-term intermittent fasting has been shown to reduce inflammation and improve cholesterol levels. In fact, one study with 24 older adults practicing time-restricted feeding (TRF) for six weeks

showed reductions in [heart rate](#) and hunger; however, no significant impact on cardiovascular function or other health markers was observed.

Mediterranean Diet

The Mediterranean diet, rich in vegetables, fruits, and olive oil and low in saturated fats, is well-documented for preventing the development of age-related conditions. This diet emphasizes the balanced consumption of essential nutrients and antioxidants, which promote [healthy aging](#).

In one in vivo study, rats fed virgin olive oil exhibited lower levels of harmful [proteins](#) and better gene expression related to mitochondrial function and oxidative stress.

Another study on 1,279 individuals between the ages of 65 and 79 found that a Mediterranean-style diet slowed the biological aging process and improved cognitive function, particularly in women. Additionally, one follow-up study indicated that this diet positively altered gut microbiota markers of frailty and led to the reduced expression of [inflammation markers](#).

Ketogenic Diet

The ketogenic diet, characterized by high fat and low carbohydrate intake, has been shown to extend lifespan and improve cognitive function in certain animal models. However, clinical trials in humans have primarily focused on the impacts of this dietary intervention on promoting weight loss, with mixed results regarding its effects on [cardiovascular health](#).

For example, one study comparing the ketogenic and Mediterranean-like diets in individuals with prediabetes or type 2 diabetes found that, while both diets led to weight loss, the ketogenic diet was associated with higher [low-density lipoprotein](#) (LDL) cholesterol levels, which is considered harmful.

Another trial reported that the ketogenic diet may reduce cholesterol levels; however, this dietary approach also led to reduced appetite and [gastrointestinal issues](#), thus raising concerns about its suitability for the elderly. Overall, more research is needed to assess the safety and effectiveness of the ketogenic diet in this patient population.

Conclusion

Notable strengths of the current study include its comprehensive review of various [diets](#) and their effects. Nevertheless, some limitations associated with this include variability in study designs, a limited timeframe, and the lack of a systematic review.

Future research should focus on [chrononutrition](#), which reflects how the timing of food affects metabolic processes and health, the impact of specific diets on aging, and refining tools to measure diet-health relationships. These data will support the development of personalized nutritional strategies to enhance healthspan and mitigate age-related conditions.

Source:

<https://www.news-medical.net/news/20240902/Dietary-patterns-like-fasting-and-the-Mediterranean-diet-unlock-molecular-secrets-to-healthy-aging.aspx>