

Many religions throughout the world observe fast days as part of their spiritual requirements and fulfillment. In Judaism, two climactic fast days are Yom Kippur and Tisha B'Av. When it comes to fasting, most have their own tried and true method designed to keep hunger and thirst at bay for as long as possible. However, scientific research backs certain practices that have been proven to be effective at both reducing hunger and preventing fasting headaches.

Hunger, as with any metabolic process, depends largely on the endocrine system. Among the many hormones that work in tandem to regulate energy balance, ghrelin is a rapid acting hormone that initiates a cascade of biochemical reactions, ultimately producing the feeling of what we perceive of as hunger. Also known to have a major influence on our energy levels, ghrelin plays a key role in meal initiation by sending signals to the hypothalamus when an increase in metabolic efficiency is necessary [1]. It was demonstrated that increases in ghrelin levels correlate with increased hunger in healthy individuals. Intravenous injection of ghrelin has been shown to induce hunger and food intake among both healthy and obese humans, indicating ghrelin's function as a meal-initiation signal for the body's short-term regulation of energy. Therefore, to suppress one's appetite before a fast, it is imperative to eat foods that lower ghrelin levels in one's body. Research has shown that foods high in fiber, particularly apples, avocados, chickpeas, lentils, nuts, oatmeal, and whole grains, keep ghrelin levels at bay. Rye in particular suppresses the release of ghrelin and lowers the insulin response, thereby boosting post-meal fullness [2]. In addition to their ghrelin-lowering abilities, foods high in fiber generally contain fewer calories than high-fat or high-protein foods per unit of volume, and therefore cause the stomach to stretch and empty slowly. This prolongs the feeling of fullness, which can delay hunger pains during a fast [3]. Dr. Barbara Rolls, a researcher at Pennsylvania State University, conducted extensive research on the volumetric theory of eating and found that

when people eat foods high in volume yet low in density (calories), they eat less during the remainder of the day because these foods keep them fuller, longer [4].

Another common side effect of fasting is the notorious fasting headache, which has been shown to result from low blood sugar, and can be exacerbated by the withdrawal of caffeine [5]. The likelihood of developing a fasting headache increases proportionately with the duration of the fast. Studies have been trying to develop medication that can reduce fasting headaches. One such drug is etoricoxib (arcoxia), a medication that is taken just before the fast to prevent headaches or, at least, to lessen their severity. However, this drug is not yet approved by the Food and Drug Administration (FDA) for consumption in the U.S.A. Another drug for fasting headaches is being tested by Dr. Michael Drescher, director of emergency medicine at Hartford Hospital in Connecticut. This drug is an anti-inflammatory pain-relief compound and works as a COX inhibitor. COX inhibitors are a form of non-steroidal anti-inflammatory drugs (NSAIDs) that target cyclooxygenase (COX), an enzyme responsible for inflammation and pain [6].

In an effort to maximize our observance of religious fast days in the healthiest and most comfortable way possible, research suggests eating a relatively high volume of complex carbohydrates before a fast and abstaining from caffeinated drinks a few days before the fast. Although the development of medications is in progress, the suggestions above are simple measures we can take in order to make fasting as meaningful as it can be.

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