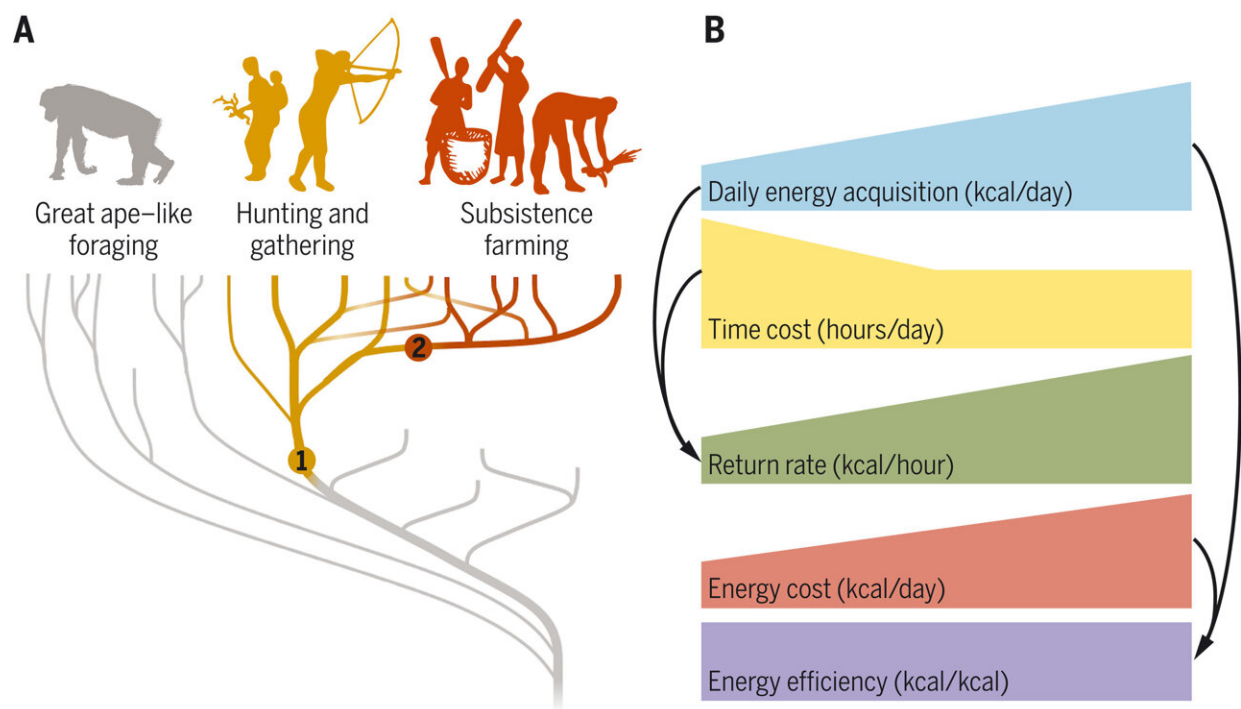


Early humans gained energy budget by increasing rate of energy acquisition, not energy-saving adaptation

December 30 2021, by Bob Yirka



Major transitions in hominoid subsistence energetics. (A) The shift from great ape-like foraging to hunting and gathering (1) and the adoption of subsistence farming during the Neolithic Revolution (2) involved changes in behavior and technology to allow access to novel food resources. (B) Through these transitions, humans paid higher energy costs in order to acquire a greater number of calories in less time; transitions from left to right are as depicted in (A). Human subsistence minimizes time costs but not energy costs, resulting in improved return rates but efficiency similar to that of other great apes. Credit: Illustrations: Samantha Shields; DOI: 10.1126/science.abf0130

A team of researchers affiliated with multiple institutions in the U.S., the Institute for Advanced Study in Toulouse, France and the Max Planck Institute for Evolutionary Anthropology in Germany has found evidence that suggests early humans gained an energy budget by increasing their rate of energy acquisition, not by taking advantage of adaptive strategies. In their paper published in the journal *Science*, they describe their study of energy expenditure versus energy intake in early humans.

In this new effort, the researchers noted that humans long ago diverged in significant ways from the other great apes. They wondered how this happened and decided to look at [energy intake](#) and expenditure. People and other animals have to put in a certain amount of work (expenditure) to receive an energy intake. Climbing a tree to fetch a banana is a simple example. The amount of energy required to climb a tree far outweighs the potential benefit of eating a single banana. But if a single person is able to throw down multiple bananas, then the overall energy intake may surpass the effort of climbing a tree a single time. To learn more about how energy intake and expenditure might have led to modern human characteristics, the researchers studied two groups of modern people—hunter gatherers in Tanzania and forager-horticulturalists in a Bolivian rain forest.

In looking at both groups, they found that both spent more energy on subsistence but also achieved energy efficiencies compared to modern great apes. This was despite the fact that bipedalism and the use of tools are known to decrease the amount of [energy](#) expended to obtain food. The result was the acquisition of more food at a much higher rate than the great apes. The researchers suggest this indicates that humans are not cost economizers but are instead creatures that operate in high throughput ways that lead to large payoffs. They suggest that diverging from the great apes in such a way led to the production of so much food

that early humans had much more time to do other things, such as socialize. They further suggest that such socializing, combined with the organizational activities involved in obtaining [food](#) led to the development of larger brains and from there, other uniquely human attributes.

More information: Thomas S. Kraft et al, The energetics of uniquely human subsistence strategies, *Science* (2021). [DOI: 10.1126/science.abf0130](#)

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