

Metabolic Rate Is Not a Setting. It Is a Gender.

Women generate less metabolic heat. The thermostat does not know this.

At a Glance

Women have basal metabolic rates approximately 200 kilocalories per day lower than men due to lower muscle mass. This shifts thermal comfort setpoint downward by 0.5 to 1 degree Celsius. A thermostat set for male comfort is cold for female comfort. [1]

Summary

Basal metabolic rate (BMR) is the energy consumed at rest for basic cellular processes: heartbeat, breathing, protein synthesis, maintaining ion gradients across cell membranes. BMR scales with body composition: primarily lean muscle mass, which consumes approximately 6 kilocalories per kilogram per day, versus fat mass, which consumes approximately 2 kilocalories per kilogram per day. [1]

Women, on average, have 6 to 10 percent lower total muscle mass than men, adjusted for body weight. This translates to approximately 200 kilocalories per day lower BMR. This is not negligible. At sedentary occupancy (1.2 metabolic rate, or 1.2 times resting energy expenditure), a woman generates approximately 1,700 to 1,800 kilocalories per day from cellular metabolism. A man of similar body weight generates approximately 1,900 to 2,000 kilocalories per day. [2]

Thermal comfort setpoint is set by the balance between metabolic heat generation and heat dissipation through skin circulation. Lower metabolic heat generation shifts the comfort balance toward cooler operative temperatures. Research on thermal comfort votes shows women prefer operative temperatures approximately 0.4 to 0.8 degrees Celsius higher than men for the same sedentary condition. This is not psychological. This is thermodynamic. [3]

A mixed-gender office with a single 22°C thermostat setpoint creates a two-tier thermal experience. Male employees find the 22°C comfortable (their metabolic heat generation and skin temperature balance is satisfied). Female employees find 22°C cool and uncomfortable because their lower metabolic heat generation means they reach skin vasoconstriction at slightly higher setpoints. [4]

Biothermal Microconditioning provides person-level cooling adapted to individual thermal needs. Areca palm clusters near each seating area create microclimatic gradients. Individuals who feel cold can move slightly away from the cluster. Individuals who feel warm can sit closer. No single thermostat enforces a false universal. No gender-based thermal injustice. Just local, perceptible, individualized cooling. Easy Retrofit. One day. Thermal equity follows. [5]