

# Should You Microwave Your Underwear?

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## STORY AT-A-GLANCE

- › Washing your clothes may present challenges you did not imagine, as detergents deposit toxic chemicals without killing bacteria, which means your machine is not sanitizing or cleaning your clothes like you may have believed
- › Although some research demonstrates using a microwave for five minutes on clean, damp undergarments may kill yeast and some bacteria, other considerations make your microwave oven a poor choice
- › You may reduce the bacteria transferred to your clothing in the wash by routinely cleaning the machine, adding essential oils during the rinse cycle and washing your undergarments separately

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Washing your clothes may not be as harmless as you might imagine. **Detergents deposit toxic chemicals** in your washing machine, on your clothes and into the environment. However, on the opposite side, wearing clothing riddled with bacteria and soaked in sweat is not a healthy answer either.

Past studies have demonstrated microwave ovens may kill bacteria associated with the kitchen, often found on sponges and other cleaning utensils.<sup>1</sup> However, microwaving foods doesn't appear to have the same effect. Not only does the process change the chemical structure of the food, but the microwave has a poor track record for killing bacteria that may be responsible for food poisoning.<sup>2</sup>

The ability of a microwave oven to kill yeast in your undergarments has been demonstrated through research. While the suggestion that microwaving recently laundered and still damp undergarments to sterilize against [Candida albicans](#),<sup>3</sup> the yeast often responsible for vaginal yeast infections, may be quick and easy,<sup>4</sup> the consequences are not.

## Your Underwear May Need To Be Sanitized After an Infection

*Candida albicans*, the yeast that causes vaginal yeast infections, is usually found living in your vaginal area in small numbers.<sup>5</sup> However, given the right circumstances, these yeast may multiply quickly, increasing your risk of developing a vaginal infection, and the irritating and uncomfortable symptoms associated with it.

Yeast enjoys living in a warm, moist environment, so even just a few drops of urinary incontinence or continuing to wear underwear in which you had been sweating may be enough to trigger an infection or keep a current infection growing. Unfortunately, just washing your underwear in the washing machine, even with hot water, may not be enough to kill those pesky bacteria and yeast.

One of the risks is re-infecting yourself after a yeast infection, or acquiring a primary infection, from underwear laden with yeast and bacteria. The type of underwear you wear may also increase your risk, as yeast tends to flourish in non-cotton, tight or dirty clothing that trap in moisture.<sup>6</sup> When you choose undergarments, it's important the crotch area is made from undyed cotton that wicks away moisture and not synthetic or silk-type material that traps moisture and may irritate sensitive skin.<sup>7</sup>

The U.S. Department of Energy recommends the heat on hot water heaters should be set at 120 degrees F.<sup>8</sup> Philip Tierno, professor of microbiology and pathology at New York University School of Medicine, disagrees, saying water temperatures need to be at least 140 degrees F to [kill bacteria](#) and germs living on your clothing.<sup>9</sup>

While the water in your washing machine may not be hot enough to kill most bacteria, a study from the *Journal of Hospital Infection* evaluated the ability of home machines to

kill *Staphylococcus aureus* and other gram-negative bacteria.<sup>10</sup>

The intention was to determine if home washing would prevent the inoculation of patients with dirty uniforms. What the researchers found was that the bacteria were not destroyed in the washing machine, but units of bacteria did reach acceptable levels if the uniforms were tumble dried or ironed, as the material became hot enough to kill the bacteria.

## **Underwear Options May Create More Problems**

Several other choices you make about your undergarments may also increase your risk of chafing, irritated skin or even infection. If you have a tendency to get bacterial or yeast infections, you may find wearing a thong makes the situation worse. Thongs have a unique way of transporting *E. coli* from the anus to the vaginal area, cautions Dr. Donnica Moore, popular speaker, women's health advocate and founder of Sapphire Women's Health Group.<sup>11</sup>

Thong underwear may also be more irritating to sensitive skin as there is more contact with vaginal tissue. It doesn't mean you can't wear thongs – just that you must find the type that fits your body correctly. If it's uncomfortable, then find a different brand.

However, going without underwear during the day is not a good idea as the seams of most pants ride up into the vaginal area, creating friction and irritation to the tissue. And, without cotton to absorb moisture, the skin may also become more irritated.

However, while going commando during the day is not a good idea, it's an excellent way of allowing your genital area to get air during the night.<sup>12</sup> As long as you're comfortable, Moore recommends [sleeping without underwear](#). The decisions you make about your undergarments boil down to your personal preferences and how easily your skin gets irritated or infected.

## **How Often Should You Wash Your Bedsheets?**

Changing your underwear at least once a day and keeping them clean and dry reduces your potential for suffering from irritation or raw skin. But those little bits of material aren't the only place you could be exposed to bacteria and spores that affect your health. In warm weather you may sweat up to 26 gallons per year,<sup>13</sup> making your bedsheets a veritable swamp of bacteria and phenomenal breeding ground for dust mites.

Dust mites are tiny creatures, measuring about 0.015 inches in length.<sup>14</sup> They feed off your dead skin cells and thrive in a moist environment as they can't drink water but must absorb it through their body. Your bedsheets, mattress and pillows are the perfect environment for their growth.

You may spend up to one-third of your life in bed with these mites. Your sweat and dead skin cells also provide a bountiful culture medium for fungus and bacteria. This begs the question of how often those sheets should be washed.

Tierno recommends that to curtail this invisible advance of fungus, mites and bacteria, your sheets should be washed once a week.<sup>15</sup> In one study evaluating the level of fungal contamination, researchers discovered up to 16 different species of fungus in each of the feather and synthetic pillows that were between 1.5 and 20 years old.<sup>16</sup>

The microbial soup in your bedsheets is a result of the bacteria living on your skin, and the fungi and bacteria resulting from your skin cells, vaginal and anal contributions, spit and sweat. Tierno believes the growth of these hitchhikers in your bed may become significant in as little as one week.<sup>17</sup> While you may not normally suffer from **allergies**, exposure to these proteins may trigger an allergic response as you are almost forced to breathe in what's growing on your sheets.

## **Could Your Illness Have Come From Your Washing Machine?**

Unfortunately, your laundry could be even dirtier after you've run it through your washing machine. Experts have found that your machine is likely teeming with bacteria that find their way onto your clothes and then onto you – and your underwear is the biggest culprit.

Charles Gerba, professor of microbiology at the University of Arizona, has spent years researching the germs that grow and thrive in your washing machine. Gerba says your underwear is the major problem as they often carry fecal material into the washing machines. Fecal material may carry a number of different bacteria, including rotavirus, E. coli, salmonella and hepatitis A virus. Gerba says:<sup>18</sup>

*"If you wash a load of just underwear, there will be about 100 million E. coli in the wash water, and they can be transmitted to the next load of laundry. There's about a tenth of a gram of poop in the average pair of underwear."*

This means if you aren't using water heated to at least 140 degrees F, you are likely grabbing these bacteria as you transfer the clothes from the wash to the dryer. Gerba recommends washing your hands after handling your wet clothes, especially children's clothing that tend to carry more bacteria.<sup>19</sup> A study analyzing the microbiome of different household washing machines bore out Gerba's assertions.<sup>20</sup>

Analysis was performed on the incoming and outgoing water from the machines and from new cotton T-shirts washed with a regular load of laundry. The laundering process appeared to allow an exchange of microbes between the incoming and outgoing water, but the microbial variety present on the new T-shirt prior to washing was still present after the washing cycle.<sup>21</sup>

The researchers found the bacteria on the clothing when it enters the wash is distributed among the rest of the clothing during the wash.

Other research found clothing washed at lower temperatures resulted in clothing with the same number of bacteria as those washed in higher temperatures, as long as the clothing was dried for 30 minutes or ironed to kill the bacteria in the clothing. You may be able to reduce the bacterial load in your washing machine by routinely running it empty with a disinfectant.

However, Kelly Reynolds, germ researcher and associate professor of environmental health at the University of Arizona, cautions that unless someone in your home is sick,

you may not have to be as concerned about the germs on your clothing<sup>22</sup> as long as you practice safe hand-washing, tumble dry your clothes and routinely clean your machine.

## Why Microwave Ovens Are Not Your Best Choice

Although research has demonstrated using a microwave oven to heat your undergarments after they've been washed, and while they are still damp, may help reduce the growth of *Candida albicans*, there are other considerations making your microwave oven a poor choice. In order to place your undergarments in the microwave oven, they must be made of cotton and not synthetic materials. Synthetic underwear may melt in the high heat you use to disinfect them.<sup>23</sup>

However, the real problem is from the microwave oven itself. Early models of microwave ovens may have leaked frequently during operation, but modern machines undergo more rigorous testing.

However, inadvertently slamming the door, opening the door frequently before the machine has stopped or otherwise misusing the door,<sup>24</sup> may increase the amount of radiation that leaks from the machine. You can test if your machine is leaking radiation using a simple test with two cellphones.<sup>25</sup>

Just like your microwave oven, your **cellphone** uses radiation, but at a different frequency. However, your oven should close completely and not allow radiation to escape. Place one cellphone in the oven (do NOT turn the oven on!) and call the phone.

If you hear it ringing from inside the machine your oven either doesn't contain radiation until it reaches a specific frequency, or it has developed a leak. The FDA limits the amount of microwaves your oven may leak through the life of the appliance to 5 milliwatts per square centimeters approximately 2 inches from the appliance.

However, biologists have demonstrated damaging effects at 0.01 MICROWatts, which is half a million times lower than the FDA standard. Conventional scientists and manufacturers cling to the idea these microwaves emitted from your cellphones, Wi-Fi

routers, microwave ovens and wireless digital equipment, such as tablets and wireless computers, are safe since they don't cause thermal damage.

## **Thermal Damage Is Not the Culprit**

Evaluating over two dozen studies demonstrating how you may radically reduce biological damage done by microwave radiation using calcium channel blockers, Professor Emeritus Martin Pall discovered the mechanism of how low level, non-thermal microwave exposure triggers biological damage.<sup>26,27,28,29,30,31</sup> The microwave radiation triggers changes to voltage gated calcium channels (VGCCs) embedded in cell membranes.

Pall's research demonstrates how microwave radiation causes massive biological damage, but not thermal damage. Based on the list of 123 studies and papers Pall compiled, the current established safety standards are off by a factor of nearly 7 million. Once VGCCs are activated, the ions stimulate the release of nitric oxide. This combines with superoxide to form peroxynitrate, and then forms hydroxyl free radicals.

These are the most destructive free radicals known to man that decimate mitochondrial and nuclear DNA, leading to mitochondrial dysfunction, the core of most chronic disease. The tissues in your body with the highest density of VGCCs are your brain and other nervous tissue, like the pacemaker in your heart and your testicles. This may explain why the rates of autism, Alzheimer's, arrhythmias, male infertility and depression are rising rapidly.

Microwave radiation doesn't have the energy to directly damage your DNA in the way ionizing radiation from X- or gamma rays do, but it may cause more DNA damage over time as a byproduct of the increased production of hydroxyl free radical creation.

Without taking steps to minimize your exposure, you may risk damage to your DNA and increase your potential risk to most chronic illnesses. This type of damage may also significantly impair your ability to respond to pathogenic infectious assaults, especially parasites.

Using your microwave oven may expose you to milliwatts per square centimeter of microwave energy. Although it may sound like a small number, it is easily hundreds of thousands to millions of times higher than the density shown to trigger biological damage in hundreds of studies.

This means each time you turn on your microwave oven, you may be exposing yourself to microwave radiation densities thousands of times higher than your cellphone. This is the primary reason I strongly advise removing the microwave oven from your home.

## **Break the Sick Laundry Cycle**

There are several ways of reducing the potential you pass along bacteria or fungi from one piece of your clothing to the next without using dangerous toxins or opening yourself up to damage from microwave radiation.

- **Tumble dry** – Your dryer will kill bacteria and fungi on your clothing when dried for at least 30 minutes.
- **Wash your hands** – It's important to wash your hands after transferring wet clothes laden with bacteria from the washing machine to the dryer in order to reduce the transfer of that bacteria to your nose or mouth, which may increase your risk of infection.
- **Wash your undergarments separately** – Keep your clothing with the most bacteria away from the rest of your laundry, especially the towels you use on your dishes.
- **Use an additive with your dirty laundry** – Adding 2 cups of 10 particles per million (ppm) of colloidal silver to the rinse cycle will infuse your clothing with silver, a natural antibacterial.<sup>32</sup>
- **Clean the machine** – Clean your washing machine routinely to reduce the amount of bacteria waiting for your clothes in the machine. Consider cleaning the surface of the drum (where the clothes are washed) with white vinegar and baking soda. Next add an essential oil that has antibacterial properties,<sup>33</sup> such as lemongrass,



peppermint, eucalyptus, orange oils and palmarosa, to the machine and running it using hot water without a load of clothes.

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