Lemon and Lime Juice as Potential Microbicides: Questions and Cautions

You may have heard that lemon and lime juice are potential microbicides. There is a lot of public discussion about this possibility but not a lot of factual public information. In a climate where everyone urgently wants new ways to prevent HIV, it is sometimes hard to sort out facts from hopes.

Here’s what we DO know:

- Women in many cultures have used lemon or lime juice for contraception and hygiene purposes for centuries
- Citrus juice is acidic. The pH of a healthy vagina is acidic, except when semen is present. An acidic environment kills sperm and many disease pathogens, including HIV. The semen raises the vaginal pH temporarily to help sperm survive.
- Some scientists have suggested that using lemon or lime juice vaginally could reduce the risk of HIV transmission by keeping the vagina acidic even in the presence of semen. Any product capable of doing that without damaging the vagina would be a contraceptive microbicide.
- Studies with monkeys have not shown negative side effects of lime juice on vaginal lining
- Phase 1 safety studies are being conducted in California and Virginia (USA) to determine whether using lime juice vaginally is safe for healthy women at low risk of HIV.
- Preliminary data suggests that, at the same concentrations, lemon juice may be significantly less effective than lime juice in killing HIV in test tube cultures.

Here’s what we DON’T Know:

- Does lemon or lime juice affect the cells of the human vaginal lining, causing disruptions or irritations that can enhance HIV transmission?
- Does lemon or lime juice induce an inflammatory response that could enhance HIV transmission?
- Does lemon or lime juice negatively affect the naturally occurring micro-organisms that keep the vagina healthy and resistant to infections?
- How much lemon or lime juice is safe to use, and how frequently?
- Does lemon or lime juice actually work to prevent HIV transmission in human beings? What concentration is necessary to be effective?

Until we know the answers to the questions above, our messages about lemon and lime juice as potential microbicides must reflect caution. Otherwise, we risk misleading people who may use lemon or lime juice for prevention, when it could have no effect or be harmful.

- We desperately need an effective, affordable, and accessible microbicide. But the only way we can know if a product is really safe and effective is by doing ethically-conducted trials. Until the trial data are collected and analysed, we can only guess whether a product works or not.
- Just because a product is “natural” rather than chemically manufactured does not automatically mean it is safe, or safe at all dosages or for all people. We must conduct scientifically rigorous research specifically designed to answer these questions.
- Remember the lesson of N-9. Early data suggested that it was safe for women to use and we knew it killed HIV in a test tube. Trial data in 2000, however, showed that N-9 was not effective in reducing HIV risk. In fact, using it more than once a day may actually increase HIV risk slightly by irritating the vaginal membranes and making it easier for the virus to enter the blood stream.
- We cannot recommend that people use any product for prevention of HIV until it has been proven through research to be safe and effective. Lemon and lime juice have not yet passed that test.