Are Essential Oils Safe on our Insides?

The following is from Dr. Doug Corrigan, who I've been following for about 6 or 7 years now.

If essential oils break down styrofoam, will they dissolve our insides?

The answer is no. But why? Seems like a reasonable question.

First, it's important to understand that essential oils don't "break down" foam. Foam is a styrene polymer, meaning that the molecules that make up foam are long hydrocarbon chains of styrene building blocks. See the image below.

So, foam is a mixture of gazillions of these long chains, but the individual chains are not connected to one another. Think of a bowl of spaghetti. The long strands of spaghetti are tangled up and mixed together, but they are not connected or physically linked together.

Essential oil molecules are small compared to these long chains. They are are also considered to be "non-polar." Non-polar means that the essential oil molecules do not have a varying charge distribution along their length. A polar molecule is the opposite of a non-polar molecule, and is defined by having a charge distribution along its length. So, for example, a polar molecule will have one end that is positive and the other end will be negative.

Polystyrene foam is considered to be non-polar. As discussed above, essential oil molecules are also non-polar. In the world of solvents, "like dissolves like." So non-polar liquids will tend to dissolve non-polar molecules, and polar solvents will tend to dissolve polar molecules. Because essential oil molecules and polystyrene foam are both very non-polar, the essential oil molecules will dissolve the foam.

But, the essential oil molecules are not "breaking down" the styrofoam. The long chains are not being cut up or chemically broken down or altered in any way. They are just being physically separated from one another and floating around in solution. It would be like if you took a strainer full of spaghetti and threw it into a big barrel of water. The spaghetti is still spaghetti. The spaghetti hasn't been broken down or converted into something else. If you removed all the water from the barrel, and poured it back into the strainer, you'd have the same exact bowl of spaghetti. Likewise, if you dissolved polystyrene foam with essential oils, and you evaporated the oil away, you'd be left with a solid of polystyrene.

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So, the first part of answering this question is understanding that essential oils don't chemically breakdown polystyrene. And, the only reason the essential oils are dissolving the foam into solution is because the essential oil molecules are small and have the same polarity as the foam. It's not because essential oils are chemically caustic or reactive.

The other part of answering this question is understanding the complex biological matrices that make up or skin, and the internal linings of our digestive system. To say it is complex is an understatement. Epithelial tissue looks nothing like, and behaves nothing like, polystyrene foam.

It is a complex composite consisting of different types of proteins, lipids, and carbohydrates of different shapes and sizes, all connected/stitched together with cross-linking molecules. It is a combination of polar and non polar molecules. Epithelial tissue is also lined with mucus, which is a very complex mixture in and of itself- consisting of massive glycoproteins called mucins, and other factors that provide a chemically resistant barrier and lubricity to our epithelial tissues.

Think about what happens when we drink water. Water is considered to be one of the most polar solvents, and it is solvating power is considered to be extreme as far as solvent go. It should dissolve other polar molecules with ease. (Like dissolves like). So, do all of the polar molecules lining the epithelial lining of your digestive system dissolve away when you drink water? What about if you put water on your skin. Does your skin dissolve away? Collagen is very polar.

The answer is: absolutely not. Likewise, neither do non-polar molecules dissolve away our tissues. Take any oil and put it on your skin. Does your skin dissolve away? What about if you drink vegetable oil?

What about alcohol? Alcohols are another very strong class of solvents, residing somewhere between a polar and non-polar solvent. Humans drink alcohol all of the time without their insides dissolving away.

Why? Because our epithelial tissues are interconnected mesh of crosslinked polymers covered with a chemically resistant barrier.

So, no, essential oils will not break down your insides because they dissolve foam.

I hope this explanation helps to set some minds at ease and gives you a tool to answer this question when asked.

Best Regards,
Dr. Doug

You can learn more about the science of essential oils (classes and books) at:
https://www.starfishscents.com/