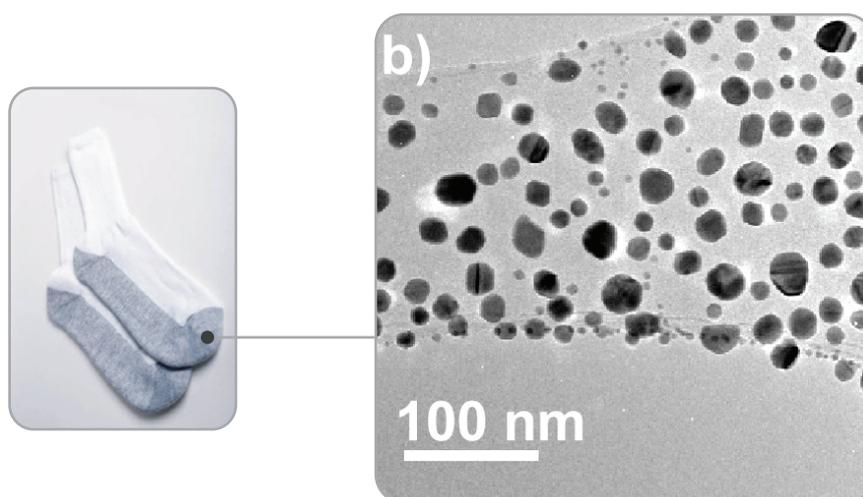


## NANO - Role Play Antibacterial Socks

Silver nanoparticles in the fabric of socks eliminate the bacteria which cause smelly feet and fungal infections. People have known about the anti-bacterial properties of silver for centuries – even the Romans used it to dress wounds. Nowadays thanks to nanotechnology silver nanoparticles can be invisibly embedded in many materials, including fabrics, where they perform their anti-bacterial effect. Silver ions released from the nanoparticles are poisonous to the bacteria that can thrive in the warmth and moisture of your feet and socks, so the bacteria in these socks are removed and the socks remain cleaner. Since silver nanoparticles are not toxic to humans, many more consumable products have been developed that use this technology.

It sounds fantastic... there is some evidence emerging now which shows that these silver nanoparticles may be hazardous to the environment.

Research has shown that these particles can get washed out of the socks and released into water treatment systems. In model experiments it was shown that silver nanoparticles are very toxic to the benign bacteria used to remove ammonia in waste water. The concern is that if large quantities of consumable products (like socks, toothbrushes, jackets, etc.) are used, large amounts of silver nanoparticles, silver ions or their aggregate forms could be released into rivers and lakes and damage the eco-system. Many agencies are calling for stricter safety testing of nano-based products and for research on the safety of these products.



### The Dilemma:

**Is it right to sell antibacterial socks containing silver nanoparticles while it is not known yet if these are entirely safe for the environment?**

**The Dilemma:**

**Is it right to sell antibacterial socks containing silver nanoparticles while it is not known yet if these are entirely safe for the environment?**

**Stakeholder: Manufacturer**

- Read the text on your card and share your opinion with the group

You represent a company that has developed the "Antibacterial socks" and is seeking to begin using them.

Your primary motivations are:

- To provide a valuable product to consumers.
- To generate profit for stockholders.

Research is not conclusive. Silver has been used for centuries for its anti-bacterial properties.

Nanoparticles occur naturally in many forms (e.g. volcanic ash, ocean spray, magnetotactic bacteria, mineral composites).

Silver is a natural substance, therefore the natural world can cope with it.

We can provide customers a healthy and comfortable product

- **Share your opinion with the group**

I think.....

- Note: you may come up with additional ideas, don't feel limited by the information above.

**The Dilemma:**

**Is it right to sell antibacterial socks containing silver nanoparticles while it is not known yet if these are entirely safe for the environment?**

**Stakeholder : Consumer**

- Read the text on your card and share your opinion with the group

You represent the consumers seeking a reliable and safe product.

Your primary motivations are:

- Purchasing a product that satisfies a need.
- Lowering the cost of a product.
- Make sure that you get a cost-effective product.

Socks which stop my feet being smelly could really change my life. If the evidence isn't conclusive then should I really worry? There has been lots of media attention on nanotechnology having unknown risks but how can science and life move on if we always worry about risks? Anyway it's just one pair, how much damage can one pair of socks do?

- **Share your opinion with the group**

I think.....

- Note: you may come up with additional ideas, don't feel limited by the information above.

**The Dilemma:**

**Is it right to sell antibacterial socks containing silver nanoparticles while it is not known yet if these are entirely safe for the environment?**

**Stakeholder : Environmental Agency**

- Read the text on your card and share your opinion with the group

You represent an agency or association that is concerned with the protection of the environment.

Your primary motivations are:

- Clean water for every one.
- Preserve the eco- system.

It is always wise to be cautious with unknowns. The fact that there is some evidence against using silver nano-particles is enough of a reason not to. Silver is definitely toxic to bacteria and that includes benign and friendly bacteria too. The environment is a delicate system where the role of bacteria is just as vital as a larger organism. We must protect this system as our world depends on it.

- **Share your opinion with the group**

I think.....

- Note: you may come up with additional ideas, don't feel limited by the information above.

**The Dilemma:**

**Is it right to sell antibacterial socks containing silver nanoparticles while it is not known yet if these are entirely safe for the environment?**

**Stakeholder: Farming & fishing community**

- Read the text on your card and share your opinion with the group

You represent the farming & fishing communities who rely on water for their livelihoods.

Your primary motivation is:

- Water should be clean so I can produce & sell healthy food.

As a farmer I have to rely on clean water for my animals & crops so that the food they produce is of the highest quality. I must be able to use naturally occurring water; I can't afford to pay for a filtration unit for the water on my farm. I am concerned with the possibility that my animals may get poisoned. I need to be able to sell my products for a good price. Will the silver nanoparticles harm my crops and/or my animals? And how do I know if the fish I catch are not poisoned by these silver nanoparticles?

- **Share your opinion with the group**

I think.....

- Note: you may come up with additional ideas, don't feel limited by the information above.

NANO - Role Play  
**Antibacterial Socks**

**The Dilemma:**

**Is it right to sell antibacterial socks containing silver nanoparticles while it is not known yet if these are entirely safe for the environment?**

**Stakeholder: Child (You)**

What is your opinion?