



# "Hidden Functions" of Familiar Products

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## Background

We thought that finding new functions beyond the original purposes might be useful for our daily lives and the environment. Therefore, we carried out **two** scientific experiments to see **if familiar daily goods and foods have effects other than their original uses.**



## Cough drops

### 1. Motivation

When I caught a cold, I took a cough drop, and my throat felt a little better. That made me curious, and I decided to look into **whether cough drops have antibacterial effects.**

### 2. Experiment

#### Method

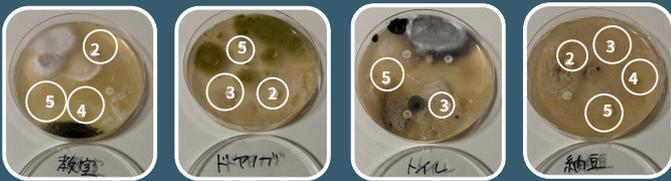
- Prepare agar plates.
- Use cotton swabs to collect bacteria from the **classroom, doorknob, toilet, and natto**, then spread them onto the agar plates.
- Dissolve **four types of candies** in water, soak filter papers in the solutions, and place them on the agar plates.



(5) Leave them for a week.

#### Result

※These are the clearer photo of the two agar plates for each bacteria.



classroom	doorknob	toilet	natto
② ④ ⑤	② ③ ⑤	③ ⑤	② ③ ④ ⑤

▲ the numbers are that don't have any bacteria around them

#### Discussion

No.1(4)⑤  
No.2(3)②,③  
No.3(2)④

**Isodine** is the most effective against bacteria, followed by **Vicks(Orange)** and **Throat Troche.**

Cough drops may have antibacterial properties!

### 3. Summary

Cough drops help **protect throat health** and prevent mild infections, especially in places without access to **medical supplies.**



## Chemical Hand Warmer

### 1. Motivation

About 1.8billion warmers were sold in 2024 —around 0.73 million tons in total. Knowing this, I wanted to find ways to reuse used and cooled warmers.

### 2. Deodorizing Effect

The activated charcoal in warmers can remove bad odors.

▷▷ **if used warmers could still have a deodorizing effect.**

### 3. Experiment

#### Method

- Diluted **ammonia water** measured into a beaker.
- A **sealable bag** with inflated with air, and sample (1) placed inside.
- The ammonia concentration was measured with a **gas detection tube.**
- Chemical warmer** and **activated charcoal** in were placed inside.



#### The first type

#### Result

$\text{NH}_3:\text{H}_2\text{O}$   
=1:100  
→10ml

gas tubes:  
3M,  
10-1000ppm



- ① before  
48 hours
- ② after/charcoal  
-8g, in petri dish
- ③ after/warmer  
-50g, in petri dish
- the yellow color shows the concentration of ammonia.

#### The second type

④ before  
24 hours

$\text{NH}_3:\text{H}_2\text{O}$   
=0.5:300  
→10ml

gas tubes:  
3L,  
0.5-78ppm



- ⑤ after/warmer  
-50g, in original bag
- ⑥ after/warmer  
-50g, in petri dish

#### Discussion

- warmers can remove ammonia as well as charcoal.
- warmers work better when spread in a Petri dish, but still have a good effect even in original bags.

### 4. Summary

Ammonia is found in toilet and pet odors. We can **put warmers in places where bad smells are a problem** to help **reduce the odor.** This idea could be easily practiced in homes or school restrooms.



## Conclusion

It was found that **cough drops**, which are foods to relieve coughs and sore throats, can have **antibacterial effects**, and that **chemical hand warmers**, which are products used to keep warm, can have **deodorizing effects.**

**Cough drops can be used as preventive or antibacterial food,** and **used hand warmers could be recycled as deodorants.**

## Future Work

By utilizing products with established safety, we can develop **low-cost and accessible** methods. These approaches are especially useful in **developing countries and during disasters.** Furthermore, such discoveries contribute to **reducing waste and creating a more sustainable society.** We propose **a new research perspective called "the study of hidden functions."**