Antibacterial properties of leaves

～persimmon, bamboo grass and *Kashiwa*～

2-2　S.Kawashima M.Shinohara A.Takeuchi

Abstract

Japanese dishes are often used leaves but we do not know their antibacterial properties. So we decided to research the effect. We did two experiments.

1 Introduction

Leaves are often used for Japanese dishes. One reason is that they have antibacterial properties.

We became interested in which leaves have the strongest antibacterial property most.

We set up a hypothesis: bamboo leaves have the strongest antibacterial property.

Reason: They are used for many dishes. Besides they preserve for a long time even at normal (room) temperature.

2 Methods and Research

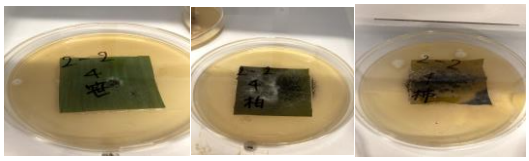
Experiment①Leaves(a four-centimeter square) sterilized in boiling water put on culture agar. Then they put into an incubator and leave them for one week later.

(Checked the change of bacteria visually.)

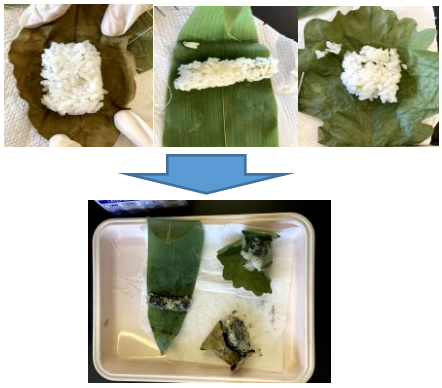
Experiment②Wrapped rice balls in leaves, put them into the incubator and keep the inside temperature 20 degree Celsius for 6 days.

3 Result

Experiment① bamboo leaves had the least bacteria.



Experiment② *Kashiwa* leaves had the least bacteria.



4 Discussion

According to Experiment ①, bamboo leaves had the least bacteria so we think they have the strongest antibacterial property.

According to Experiment ②, *Kashiwa* leaves had the least bacteria so we thought the antibacterial property of *Kashiwa* leaves is strong but we had flaw when we was doing the experiment. We didn`t unify the standard about how to wrap rice balls in leaves. The number of times of experiments were few.

Therefore we think bamboo leaves`antibacterial properties is stronger because of incompletion of the Experiment②. However, we need more experiments to see the actual effect.

5 Reference

Cookpad https://cookpad.com/

葉の抗菌作用

https://www.nagano-c.ed.jp/seiho/intro/risuka/kadaikenq/paper/2015/2015-2%20hanokoukinsayou.pdf

What is appropriate diet?

Member・2-2 No.6　Shimizu Risa,　Ohno Yuine

・Abstract

Extreme dietary restriction and the lifestyle without enough sleep have a bad influence on our body.
The food of low glucose and enough sleep help the appropriate diet.

・Introduction

Everyone knows there are many people who get sick by wrong diet. So, we'd like to recommend correct diet.
We thought how ways of diet will bad for our body.

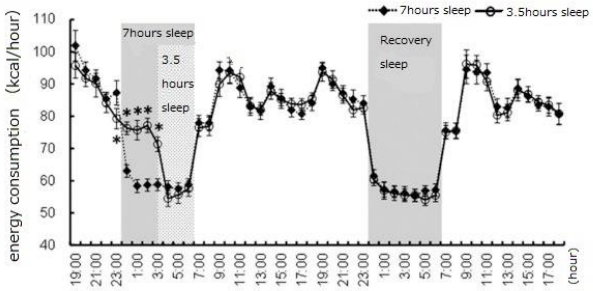
~ Extreme dietary restriction ~
We thought extreme dietary restriction will have our body bad effects.
For example, unbalanced diet cause malnutrition and a short of musculaine cause metabolic disorder.

~The diet without enough sleep~
We thought the diet without enough sleep will have our body bad effects.
For example, Lack of sleep cause excessive stress and excessive eating and drinking.

・Result

1.　What is better meal for diet?
We searched batter meal for diet. The list of the following show some food lumber of low glucose.
Meal is almost better for diet because it is included the protein.

2,　The relationship between sleeping hours and diet.
The best sleeping time is 7.7 hours discovered by researchers.
The lack of sleep especially REM sleep effect appetite for unhealthy dish contain sucrose and lipid.
Furthermore, too much sleep is gain weight.



Carbohydrate	Bean	Vegetable	Fruit	Snack	Drink	Others
Brown rice	Soybean	Greens	Avocado	Nut	Water	Mushroom
Tuber	Green soybeans	Bean sprouts	Yuzu	Cabbage	Tea	Algae
		Broccoli	Lemon	Tomato	Coffee	Egg
		Cauliflower	Raspberry	Cucumber		Cheese
				Chinese cabbage		

・conclusion

・The food of low glucose help the appropriate diet.
・Excessive sleep and the lack of sleep have a bad influence on our body.
・The 7.7 hours sleep time is appropriate for diet.

・Reference

https://toyokeizai.net/articles/amp/177098?page=3
https://wpi-iiis.tsukuba.ac.jp/uploads/sites/2/2018/01/20170110_LazPR.pdf
https://www.lacabostyle.jp/carb

A relationship between the gaze of the color and temperature.

2-2　Ueki Ayana　Goto Yu

Abstract

It is said that you should use the curtain using the cold color to soften the summer heat. It wanted to know whether it was true. So gazed at red or blue paper to examine changes in human body temperature. As a result, it turns out that there is no relationship between color gaze and changes in body temperature.

1, Introduction

As there was a relationship between color in the view and perceived temperature and was interested, we wanted to research the influence that the gaze of the color gave for a change of the temperature. So an experiment was conducted with the theme of “How the body temperature changes when watching warm color and cold color?”

（1） Purpose

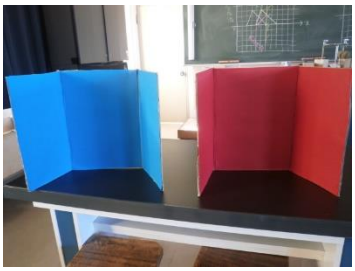
To utilize the influence that a color gives for temperature for selection of color of daily necessities.

（2） Hypothesis

Body temperature rises by gazing at warm colors and falls by gazing at cold colors.

2, Methods

Research1: Red and blue paper was selected for research. Subjects were measured their temperature before and after they gazed at the paper for 5 minutes.



(figure1)

Research2: At first, subjects were measured their temperature and waited 2 minutes. Temperature is taken again and we set (figure1) and gaze the color.

It measures body temperature every 2 minutes and gazes for 10 minutes. And we take (figure1) out of subjects and take temperature 2 minutes later. ※The subject listen to music during an experiment all the time.

3, Result

Research1

Red				Blue		
before	after			before	after	
36.0	36.1	+0.1		36.8	36.9	+0.1
36.3	36.5	+0.2		35.9	36.6	+0.7
36.8	36.8	+0.0		36.3	36.3	+0.0
36.3	36.5	+0.2		36.4	36.6	+0.2
36.6	36.8	+0.2		36.1	36.3	+0.2
36.7	36.8	+0.1		36.9	36.9	+0.0
36.3	36.1	-0.2				

4, Discussion

In research1, enough data as a result of our research was not gotten because the environment was not equal. In research2, which was conducted after modifying the conditions, more accurate data was gotten. However, it was not suitable for judge that gazing color is related to changing body temperature.

Therefore, the hypothesis is judged to be wrong.

On the other hand, some people said they felt cool while watching blue, so it is thought that watching color does not change the body temperature, but only affects the sensible temperature.

5, Reference

「Homepage color scheme that can be understood from the basics」(webcolordesign.net)

Does the higher the heart rate, the better the concentration?

2-2　Igusa Rena　Kasahara Airi　Kabasawa Shiori

Abstract

In order to improve learning efficiency in the future, research on the relationship between heart rate and concentration was considered useful.

1 Introduction

(1) Purpose

When studying for a long time, if you can improve your concentration while switching your mood by exercising, it will be two birds with one stone.

(2)Hypothesis

The higher the heart rate, the better the ability to concentrate.

(3)Reason for the hypothesis

First, it makes it easier for oxygen to reach the brain.
Second, dopamine and adrenaline come out.

2 Methods

~Experiment1~

①Take the pulse of 7 people.
②Divide into groups of 4 and 3.
③ Have three people remember the contents of a certain material.
④Have four people multiplied by 100 squares.
⑤Have the people who did ③ and ④ exercise for less than 2 minutes on another day.
⑥Then, conduct the same experiments as in ①.
⑦To compare the score or time of the first and second rounds.
⑧Ask collaborators to answer the questionnaire.

~Experiment2~

① Take the pules of 4 people.
② Have four people do complicated calculations.
③ The following is the same as the contents of the experiment 1.

3 Result

~Experiment1~<Calculation>

	normal time			after exercise		
	pulse	time	mistakes	pulse	time	mistakes
A	80	1:42	1	128	1:33	1
B	80	2:54	0	160	1:47	0
C	72	3:11	0	108	1:36	0
D	84	1:19	0	148	1:16	0

<Memorization test>

	normal time		after exercise	
	pulse	score /15	pulse	score /15
E	72	8	120	9
F	64	9	120	12
G	68	10	116	11

~Experiment2~<Calculation>

	normal time			after exercise		
	pulse	time	mistakes	pulse	time	mistakes
A'	96	1:29	0	168	2:08	2
B'	72	1:46	1	124	2:15	1
C'	80	2:36	0	108	2:59	1
D'	60	2:45	2	112	3:32	0

4 Consideration

What can be said from Experiment1

・There is relationship between heart rate and concentration.→The test results were better when the heart rate was high than when the heart rate was low.

What can be said from Experiment2

・There is no relationship between heart rate and concentration.→There were many opinions that it was easier to calculate the heart rate in normal times. There was no difference in the test results whether the heart rate was high or low.

From the results of Experiment1 and Experiment2, it is considered that there is no relationship between heart rate and concentration.

Measure to reduce women being molested

2-2 Group12 Yui Matsushima Natsuko Yoshida

Abstract

Researching the differences on how we notice signs coming from other directions while using smartphones and earphones causing increased insensitivity to the environment around us.

1. Introduction

Purpose: To confirm the measures which are introduced around the world, to see if these measures are effective.

Hypothesis: The places which are prone to harm have something in common.

2. Methods

①Leave 5 meters between personA and personB in front of A.

②Start walking at the same time, and A tries to catch up with B.

③On feeling A coming too close, B raises her hand. At that time, both of them stop walking.

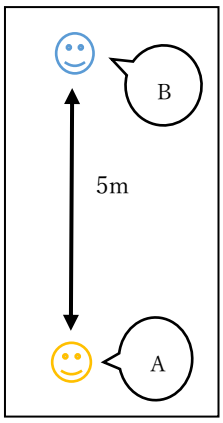
④Measure the distance between A and B.

⑤Repeat three conditions.

1)Walking normally

2)Using a smartphone

3)Using earphones



❶From Gaccom 安全ナビ, pick out two places which are prone to harm.

❷Using “Google Map”, examine road width, street lights and the look of the place.

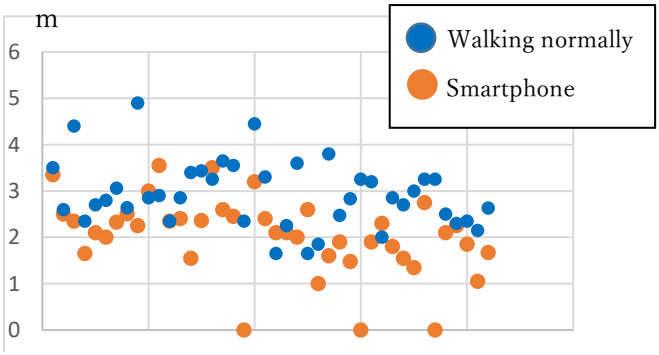
3. Result

・Using earphones

It was impossible to hear ambient sounds even at the lowest volume.

・Walking normally average 2．84m

・Using smartphone average 2．04m



Road width, street lights and the look of the place could not be strong evidence.

4. Discussion

・Using earphones prevents us from hearing ambient sounds completely regardless of the volume.

・When we walk while using the smartphone, we end up concentrating on the smartphone and become insensitive to ambient sounds or signs.

・We have to look out even though the road is not narrow and dark because there are not very differences between the places which are prone to harm and not.

5. Referance

Research to dry hair quickly

2-2 group15　Machi Yonekura　Shio Kasukawa　Moeka Baba

Abstract

It is waste of time to dry your hair for a long time. It can be described that how to get rid of wasted time in an easy way that anyone can. To address these problems, we researched how to dry hair quickly of four ways, and evaluated, it finds broking of three parts of the best way to dry hair quickly.

Introduction

i .Background

We felt that there are a lot of Maejo students who think it was a waste of time to even dry their hair. Then, we want to study how to reduce the drying time. In the paper, we will state it.

ii .Hypothesis

① The more hair you divide, the shorter time will take to dry.

② The time to dry hair using comb is shorter than not using it.

The reason of hypothesis is that we thought much wind through the hair by combing and parting it.

Results

	average time
Standard	12:22
Blocking 2parts	9:43
Blocking 3parts	7:40
Blocking 4parts	10:36
Combing	8:03

Figure1: Average time to dry four methods five times.

<The wig used in the experiment>

	Difference
Blocking 2parts	-2:35
Blocking 3parts	-4:38
Blocking 4parts	-1:36
Combing	-4:19

Figure2: Difference from the standard.

From Figure1 and figure2, blocking the three parts make a difference of up to 4 minutes and 38 seconds from the standard. Also, the comb drying way the second quickly.

Methods

<Premise>

The standard weight was determined from the experimental results obtained in the preliminary experiment. Common to experiment ① and ②, wig soaking with standard water was weighted. It was dried until the standard mass. Also, indoor temperature and humidity were not thought for this experiment.

① It is given a trial the way of blocking which part it two stages, three stages and four stages each five times. It was timed average times which taken it dried.

② It was dried with drier, combed it. It was timed average times which taken it dried like ①.

Discussion

① As a result, blocking three parts took time shorter four minutes thirty eighth second to dry wig than the way took time the longest. Blocking three parts is the best way to dry it quickly. Considering this result, blocking two parts prevented the wig from passing enough wind because amount of parting hair is little. Moisture of tip of hair fell by blocking four parts, because amount of parting hair is too much. After all, the wig kept state wet.

② Drying with hair combed is second the best way to dry wig quickly. The result was thought the wind passed all parts like ① experiment.

*Blocking ···Part the hair, small pieces.

The way cactuses live
~What is CAM type of photosynthesis~

2-4 Yuna Iizuka

Abstraction

CAM type of photosynthesis is Cactus'characteristics different from other plants.Endurance for dryness of cactuses might be connected with this photosynthesis.

Introduction

On CAM type of photosynthesis, cactuses open its stomas to get CO_2 at night. They convent CO_2 into malic acid. In the daytime, cactus synthesizes sugar taking CO_2 out malic acid it stored. We examined this photosynthesis attracting relation with CO_2, breathing ,transpiration.

Methods

Most Cactuses originally come from Americas, so we used two kinds of cactuses ,one is Dolichothele surculosa ,the other is Echinopsis calochlora.We prepared circumstances [A and B],and bags [a and b] .

A: in the sunshine

B:out the sunlight / colder than circumstance A

a:bag of air b:bag of exhaled breathe

Experiment 1;put cactus into bag a or b. gauge the concentrate of CO_2 with gas detector tube after 8 hour.

Experiment 2;prepare a bottle for cactus has small opening,make nail polish forming on the surface of water to prevent water from evaporating .weigh cactus and bottle together before putting into plastic bag .

Experiment 3;cut cactus into pieces ,squash the cactus ,examine cactus's sap using ph meter and sugar content meter

Hypothesis

Experiment 1;concentration of CO_2 decline much on B than A because cactuses open its stomas at night. In bag b ,cactus try to get CO_2concentration of CO_2 declines.

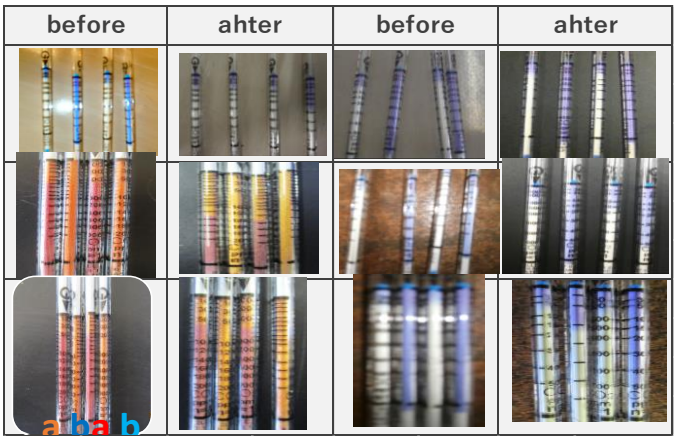
experiment2;amount of decrease is much in B than A ,and in b than a because cactuses open its stomas at night.

Experiment3;ph of cactus of B is smaller than it of A by malic acid

brix percent measured by sugar content meter is higher in A than B cactus synthesizing in the sunshin

Result

Experiment 1



a b; Dolichothele surculosa ab; Echinopsis calochlora the concentrate of carbon dioxide rised inA-a, didn't change in B-a.

Experiment2 change of weight (g)

	1	2	3	average	1	2	3	average
A-a	-0.91	-0.28	-0.3	-0.4967	-0.82	-0.66	-0.69	-0.7233
A-b	-0.16	-1.26	-0.68	-0.7	-1.63	-0.66	-0.55	-0.9467
B-a	-0.04	0.05	0.15	0.0533	-0.16	-0.64	-0.04	-0.28
B-b	0.04	0.15	0.18	0.1233	-0.2	-0.05	0	-0.0833
	Dolichothele surculosa				Echinopsis calochlora			

Weight decrease in both A-a and A-b.Dolichothele surculosa's weight increase in B-b.

Experiment 3

		ph	brix		ph	brix
Dolichothele surculosa	A	6.23	2.3	Echinopsis calochlora	5.3	1.4
	B	5.18	2		5.18	1.1

Acidity is strongr in B than A .percentage of brix is higher in A than B .

Discussion

Released CO_2 seems to be more than absorbed CO_2 in the sun, be as much as absorbed CO_2 at night,

Dolichothele surculosa ' s weight increasing is considered to be caused by function of spine collecting morning water. Spine's difference between Echinopsis calochlora and Dolichothele surculosa seems to bring result of experient2. Acidity in B seem to be from malic acid. Higher brix percent considered to be a solid created by photosynthesis

Referance;{Horibe'slabolatory}https://www3.chubu.ac.jp/faculty/horibe_takanori/himitu/

How to remove more E. coli than alcohol disinfection with a single hand wash ?

～Focus on the difference in time～

2－7　group2 Arai Chiharu　Araki Miyu　Kanuma Rikako

Abstract

As a result of examining the amount of E. coli on the hands using an agar medium, The amount when washing hands for 45 seconds was closest to the effect of using alcohol

1.Introduction

(1)Purpose　Though there is no alcohol,　we want to substitute by hand washing

(2)Hypothesis　It would take 30 minutes. It is because it often said that 30 minutes is necessary to wash our hands thoroughly. It was found that it was impossible in less than 30 seconds from the preliminary experiment.

2.Methods/Research

<Used Products>

70vol%alcohol 3.1ml, hand soap(*kireikirei*), agar water 300ml(to rinse away after washing hands)

<How agar works>

Agar contains substances that E.coli likes. When E.coli adheres to agar, E.coli grows.

<Experimental method>

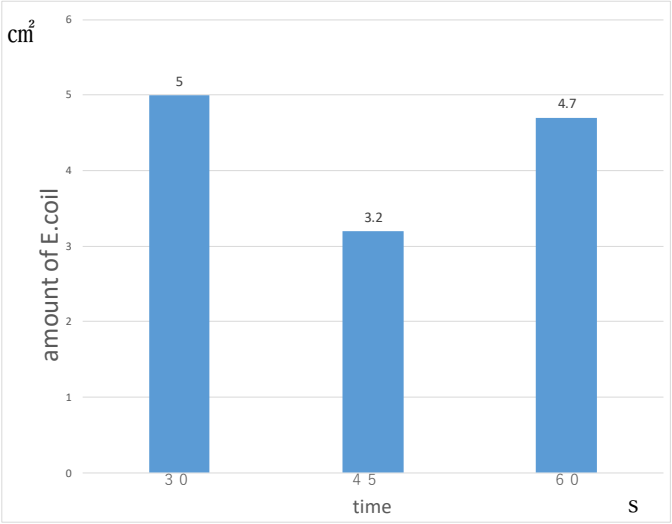
① 3 people wash 3 times each in 30, 45 and 60 seconds .

② After washing their hands, press their hands against the agar.

③ Observe after leaving at 37 degrees for 24 hours.

The 1 ㎠ grid on the back of the hand petri dish was used to measure E. coli.

Relationship between time to wash hands and amount of E. coli remaining



The result when using alcohol was 1.0 ㎠.

45 seconds was the closest to the result of alcohol.

4.Discussion

1.It is considered that 30 seconds is not enough time because the most bacteria remained at 30 seconds.

2. It is probable that the reason why the bacteria remained at 60 seconds than at 45 seconds was that the soap had dried up while washing the hands.

5.Referance

厚生労働省―手洗い https://www.mhlw.go.jp

インフル対策に手ピカジェル／健栄製薬（公式）
www.influ-enza.jp

Grow your Original Succulents～How to make it your favorite color～

2-7　3　Osawa Nonoka　Kubo Hinano

Abstract

In order to grow succulents to the desired color, we investigated the relationship between the autumn leaves and the temperature of succulents.

1. Introduction

(1) Purpose

Make succulents the color you want.

(2) Hypothesis

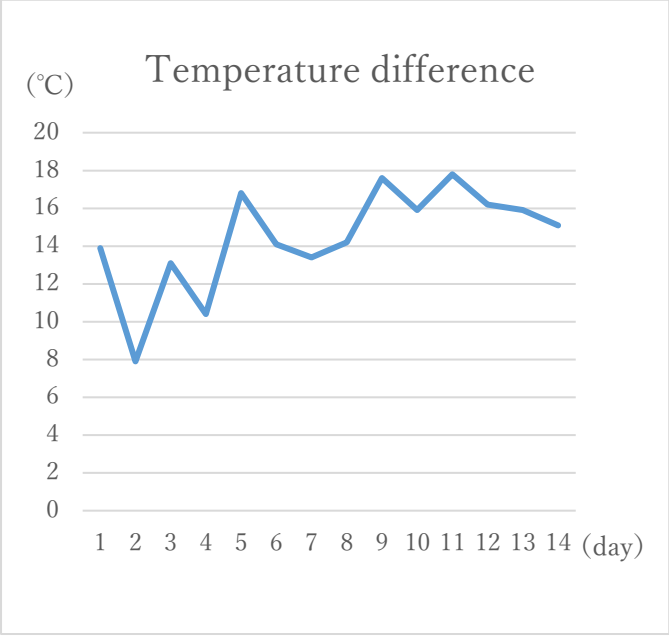
Succulents turn red when there in a temperature different.

Ground: In the preliminary study, the temperature was kept at 10℃.

2. Methods

Place the succulents near a window in the sun at 8am and place them in a cool incubator set at 5℃ after school. Then, the temperature difference from the maximum temperature of the day is calculated and recorded.

3.Research results



The temperature difference was about 7.9 to 17.8 degrees Celsius, and there was not much change, and the temperature difference increased or decreased from day to day.

1day　　**14day**

From the 14day, the stem part turned slightly red.

4.Discussion

On the 14th, succulents began to show signs of turning red, while the temperature difference was small and scattered, contrary hypothesis.

From this result, it is conceivable that the difference in temperature has nothing to do with the autumn leaves of succulents. Alternatively, questions arise as to whether there was a problem with the method of the experiment or the method of obtaining the results.

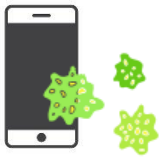
If there is a problem with the method, it could be due to the fact that only two strains of succulents could be used for money and time, the short duration of experimentation, and the method of measuring and calculating temperature difference.

Therefore, I order to confirm the authenticity of the first hypothesis, it is necessary to first review the experimental method and consider which one was wrong, the temporary method or the experimental method.

5. Reference

前橋の過去の天気

Weather.goo.ne.jp



Research to visualize smartphone dirt

2-7-6 Uchida Chisato/ Wasada Ayano

1 Abstract

Now that infectious diseases have become a problem, we have been interested in and researched the germs that stuck to smartphone cases. When a control experiment was conducted under 3 conditions, it was found that smartphone cases have a lot of germs, and that there was no significant difference in the effectiveness of the three disinfection methods.

2 Introduction

The COVID-19 epidemic has made people more sensitive to the germs than ever before. One research showed that more than 5 million germs per square centimeter were stuck to our hands. If so, there may be a lot of germs on the smartphone cases. By visualizing the germs, you can feel the existence. Also, finding a simple and effective disinfection method will help to prevent having illness.

➡Hypothesis

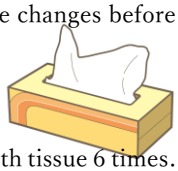
(1) There are germs on the entire surface of the smartphone cases, because in the study, a lot of germs were detected by MC-Media Pad, which can visualize germs.

(2) The disinfection sheet can reduce E.coli the most because a disinfectant sheet is available for smartphone cases.

3 Method

(1) A controled experiment is conducted under the following 3 conditions. (① wipe with tissue ② wipe with alcohol disinfectant ③ wipe with disinfectant sheet)

(2) Using agar that propagates E.coli, compare changes before and after treatment.



[3 way of processing]

①Tissue: blow smartphone cases and wipe it with tissue 6 times.

②Alcohol disinfectant: add 1 ml of alcohol disinfectant to Kimwipe and wipe the smartphone cases with it 6 times.

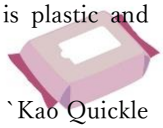
③Disinfectant sheet: non-alcoholic, available with smartphone cases, wipe them with the disinfectant sheet 6 times.

[How to compare]

Divide the petri dish (8cm・14cm) into 27 squares and count the amount of spots.

*The same person wipes all smartphone cases.

*The smartphone case used in the experiment is plastic and purchased at DAISO.



*the disinfectant sheet used in the experiment is `Kao Quickle Joan Jokin Sheet Keitaiyo.

4 Result

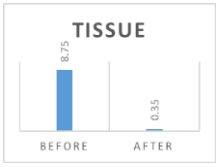


Figure 1. Wipe with tissue

①Spots were reduced from 8.75 squares to 0.35 squares. 96% of E-coli was disinfected.

Figure 2. Wipe with alcohol disinfectant

②Spots were reduced from 19 points to 1 point. 95% of E-coli was disinfected.

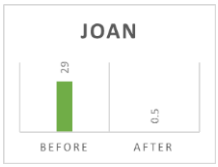
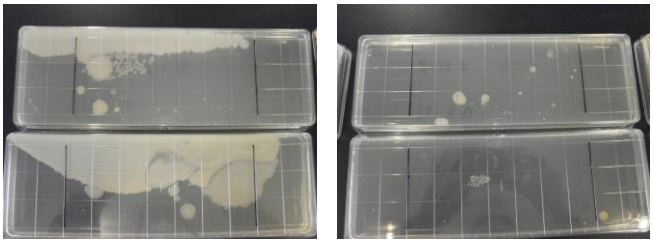


Figure 3. Wipe with disinfectant sheet

③Spots were reduced from 29 points to 0.5 points. 98% of E-coli was disinfected.

①Wipe with tissue (Before and after)



5 Conclusion

(1) We did not know how dirty the smartphone was because the usage time and usage were not decided, but in any case, we found that E.coli was stuck to entire back of the smartphone in daily life.

(2) Contrary to hypothesis, all process we did disinfect 95% germs or more. Considering the ease of use, it was found that even tissue can sufficiently reduce the amount of germs without alcohol, and all our disinfect methods were simple and effected, so it will be easy to take these actions into everyday lives.

It is better to choose how to clean your smartphone cases.

6 Reference

手洗いの科学

https://pro.saraya.com/pro-tearai/science/index.html

Extermination of ants

without using commercial ant repellent

2-7-7 Mayu Kikuchi Noyuki Cho

Abstract

We did the experiment to learn how to exterminate ants without insecticide. We prepared some familiar substances and searched for the one that ants most avoid.

Introduction

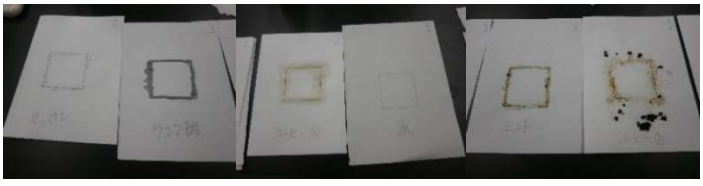
We wanted to get rid of without using commercially available, ant repellents, so we focused on pheromone, and made this plan. But pheromone has not yet been elucidated, and we have decided that it is difficult for us to deal with it. So we looked for ways to get rid of ants with nearby substances without using commercially available ant repellents. Experiments were conducted using lauric acid, which is believed to have antibacterial activity, citric acid and mint with an ant-hating odor, and strong-smelling coffee.

Method

① Mix 1.00g of a substance* with 1.00g of water in a beaker. Prepare this as much as the of different types of substances.

② Mark a copier paper with a square by five centimeters with a bite. Paint each candidate substance with a glass bar on a drawn mark.

③ Place an ant inside a squre and time it takes for her to escape.



〈Substances used〉*

Insect repellent…soap containing lauric acid

Smell…ground coffee powder, coffee liquid, cltric acid

Result

	once	twice	three times	average
soap	24.5	26.9	18.5	23.3
ground coffee powder	33.0	21.8	12.1	22.3
coffee liquid	56.3	37.3	204.0	99.2
mint	28.5	39.8	16.8	28.4
cltric acid	39.3	267.0	354.8	221.0
water	21.3	48.5	52.0	40.6

Units: The time it takes for ants to escape from the square frame (Seconds)

Discussion

Because the number of experiments was low due to ant deaths, statistical analysis showed no meaningful difference. But the substances that are considered to be effective as ant repellents are actually compounded with the ingredients of the substances, which are effective in various ways. We thought cosmetics world replace ant repellents. If we increase the number of experiments or the number of other candidates, we might get the results new wanted.

Referance

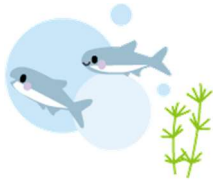
「アリ類の化学的行動制御機構の研究と害虫管理への利用」
http://jppa.or.jp/archive/pdf/64_09_26.pdf

「P-52 トビイロケアリ(Lasius japonics)のフェロモン類の解明：長鎖アルキルケトン類の道しるべフェロモンとしての可能性(ポスター発表の部)」
https://www.jstage.jst.go.jp/article/tennenyuki/54/0/54_609/_article/-char/ja/

Kinds and Condition of Algae Occurring in the Aquarium of Killfish

~Paying attention to light color,water quality and pH~

2-7-11 Machida Ayaka　Kobayashi Moeka　Seki Sakurako



Abstract

We wanted to know what algae are produced by the conditions of light color,water quality and pH,so we created various coditions and conducted our research. As aresult,we ware not able to obtain common conditions that are likely to cause algaes from the experiment. However,we were able to summarize the conditions by referring to various materials.

Hypothesis

Mainly, green algae, diatoms, blue green algae, red algae occur, besides that dinophyceae, crypto, algae, euglena algae and glaucophyte occur.

The Contents of a Study

① Prepare 15 killfish and put them in a 5L aquarium. Putt the water in the tank after 7 days in 10mL beakers,and prepare 6 beakers each whose pH is adjusted to acidity,neutral and mild alikaline.Mild acidity,neutral, and alkaline werw added to anartificial meteorological instrument set at25 degrees Celsius, and the light color was red,green,and white (80 light quantity) and left unattended for 10 days.10 days later,I took out the beaker and checked if the algae were growing and examined them under a microscope.Put the killfish in the aquarium and put the water from the aquarium in a　beaker for 17 days and experimented and observed the same as the previous experiment.

② When we first observed the clean water quality,we found that red algae were found in acidic beakers and green algae were found in other beakers.

③ Put killfish in the aquarium and putthe water from the aquarium 17 days old in abeaker to conduct the same experiment as the one on the 10th day.

Experimental Result

DAY 7

light / pH / color	white	red	green
mild acidity	①nothing ②nothing	①nothing ②nothing	①nothing ②nothing
natriuretic	①green ②green	① green ② green	①nothing ②nothing
mild alkaline	①red ②diatom	①nothing ② nothing	①nothing ②nothing

DAY17

light / pH / color	white	red	green
mild acidity	①green ②green	①green ②green	①nothing ②nothing
natriuretic	①green ②green	①green ②green	①nothing ②nothing
mild alkaline	①green ②green	①green ②green	①nothing ②nothing

※　in the experiment,the conditions did not match and the correct research results were not obtanained.Therefore,it was decided to examine by referring to the Internet,picturebooks and litereature.

Consideration

・Blue algae.....Containing a blue pigment called chlorophyll and phycocyanin. Occur in a place where the current of water does not hit much.

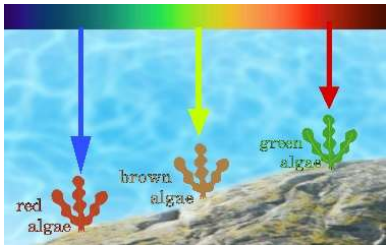
・Eddy flagellates.....There are many varieties,not particular,but they still tend to prefer light. There are many reports abroad that raising the water temperature to 28 degrees Celsius temporarily calmed down Dinos' power.

・Led algae.....Occur only inrunning water environments Eutrophication of aquariums is another cause.

Diatomaceous substance.....Excessive nutrition and lock of light cause.When the water quality stabilizes, if disappears naturally.

・Filiform algae.....Often seen when overnourished or lit. It often grows where water flows easily.

Summary



・Irradiation of blue andyellow wavelengths for a relatively long time results in weakening of thegrass and growth of algae.

・　In　clear water such as an aquarium, blue light around 480nm is easily transmitted. Therefore, algae have an accessory pigment: chlorophyll b, c,carotenoid, phycobilin, auxiliary chlirophyll that easily absorbs such blue and yellow lights.

References

・http://www.aquagarden.co.jp/SINZUI/MORUI.htm
・http://www.aquaqua.biz/350/post_44.html
・https://www.jst.go.jp/cpse/jissen/pdf/houkoku/TK150008-A-16126.pdf
https://medakahonpo.com/wp/メダカ飼育とコケ、藻対策/#i-2
・https://www.ichigaya-fc.com/howto/articles/howto_10.html
・http://www.maroon.dti.ne.jp/seraphish/text/koke.html

Comparison of the antiseptic effect of hand soap used at schools or home

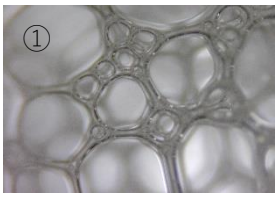
2－2　Kana Akutsu　Kinuka Iizuka

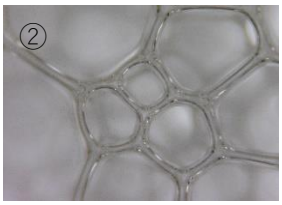
Abstract

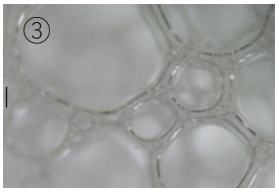
The importance of washing our hands was increasing now. It can be described that hand soaps that have high antiseptic effect are needed; however, it can be difficult to know which the most effective hand soap to choose at supermarkets. To address these problems, we researched the antiseptic effect of hand soaps by using culture mediums for Escherichia coli, and “kirei kirei” was turned out to be the most effective hand soap.

1. Introduction

A purpose is to known the imminent hand soap that can reduce bacteria of the hand most. Hand soap that can make a fine bubble is good for wash stains out of hands. Bubble is finer then surface area of stick to bubble in hands is large and it is easy to wash away stain and germ because high-density bubble makes suction power due to a physical shape.







① Kirei kirei
② Syabonetto pink
③ Arbos

2. Methods & Research

A culture medium for Escherichia coli was used. Hands which have washed by four kinds of hand soap and which have not done so were touched it. Hand soap used in an experiment are “Kirei Kirei”,which is spread through household,”Arbos medicated soap “ and “Syabonetto Pink”, which are used at school. They were kept in an incubator for 24 hours. Moreover, they were taken pictures and be observed. Two hands were used for each experiment. A way of washing hands and the time to do it was decided. The quantity of hand soap was unified by using same bottles.

3. Result

Kirei kirei

Syabonetto

Arbos

Counterpart

4. Discussion

- In order of the culture medium with the lowest number of Escherichia coli propagated were “Kirei kirei”, “Syabonetto pink” and “Arbos medicated soap”.
- There is not a connection between the size of bubble and quantity of E.coli.

5. Reference

Junko Sonoda,Takuya Sakai,Yukio Inomata.（2014）. Liquid Oil that Flows in Spaces of Aqueous Foam without Defoaming.

Recycle Chalk

How to harden chalk dust to be as strong as off –the-shelf products by adding water

2-2-5　Ota Shione　Tosaka Hana　Suzuki Asae

Abstract　It is wasteful to throw away a lot of chalk dust. To address this problem, chalk dust need to be new chalk which is equal strength to off-the-shelf-products. For that, we searched the best percentage of water which is mixed with chalk dust. And we compared the strength of chalk we made with off-the-shelf-products by dropping chalk. As a result, we discovered that the best proportion of water is 30%.

1 Introduction

We want to reuse chalk dust someway because it is waste that a large amount of chalk dust is thrown away every day. For that, chalk dust need to be chalk which is strong and can be written on blackboard.

(“Strength” means not to be broken easily when it is dropped.)

2 Hypothesis

When the amount of water is 25% of the chalk dust, the chalk has the same strength as the off-the-shelf-product.

Reason: According to the preceding experiment, we found that chalk dust can be hardened by only adding water. In a preliminary experiment to confirm that, 25% was the easiest to make and the result was good.

3 Methods

① 20 grams of chalk dust is mixed with water.

② The mixture is put in the mold and is pushed with another chalk.(Picture1)

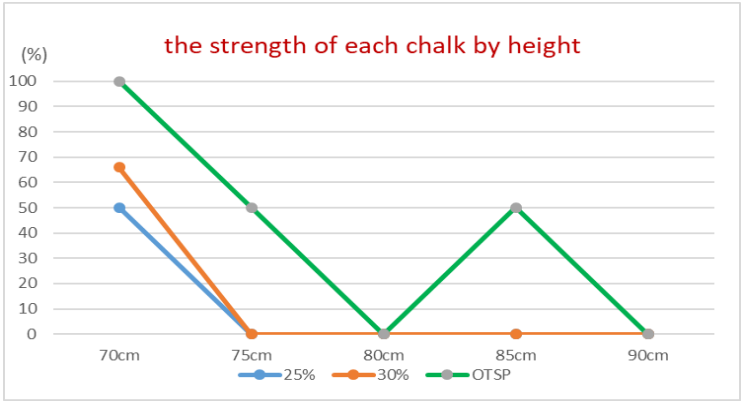
③ It is dried for two days.

④ It is dropped while changing the height, and strength is measured.(Picture2)

(Picture1)

(Picture2)

4 Result



(1) Chalk with 30% water to chalk dust was stronger than chalk with 25% water to chalk dust. Chalk with 30% water to chalk dust was nearer strength off-the-shelf-products.

(2) When chalk were dropped from any height, there were no chalk which did not chip.

(3) Off-the-shelf-products was insoluble, while the chalk we made was soluble.

(4) Chalk with 25% water was easiest to make. Chalk with under 25% water was difficult to put in the mold. Chalk with over 30% water was difficult to put out of the mold.

5 Discussion

From(1)and(4), chalk with 30% water was best.

From(3), our chalk need coating to prevent it from being soluble in water.

6 Reference

ダストレスチョークの工場紹介

／日本理化学工業株式会社

https://www.rikagaku.co.jp/eco/monodane.php

25%→  　30%→ 

The relation between the size of a grain of soil and the speed of water

2-2　group8　Saito Wakana　Takamatsu Rika　Nagahama Taki

◎ABSTRUCT

A dirt playground after the rain often becomes muddy. It can be described that the drainage is bad, however it can be difficult to know what to do to make the current faster. To address the problem, we paid attention to a layer of soil, and evaluated the order of soil to make water flow faster.

1. INTRODUCTION

(1)Triger

After the rain, there was a puddle in the schoolyard or a park. When I saw it, I wished the water would flow out soon.

(2)Hypothesis

From the top, the order with the small, medium and large particles is the largest.

2. METHODS/RESEARCH

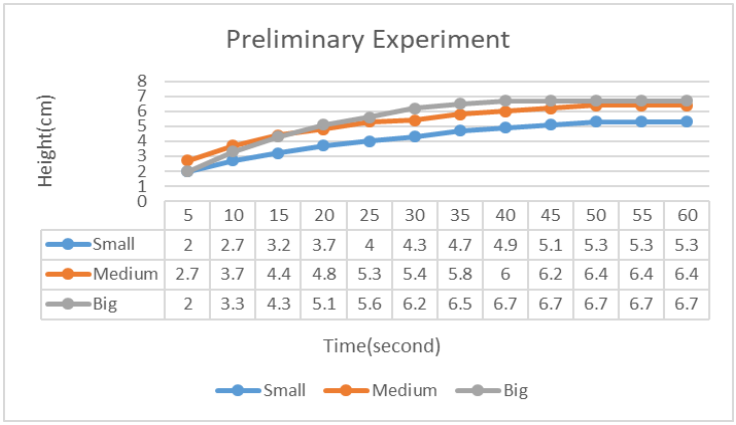
①Put soil in layers in a plastic bottle.

②Wrap clothes(10×10) around the mask of a PET bottle.　↓Figure1

③Fasten a public bottle to a beaker

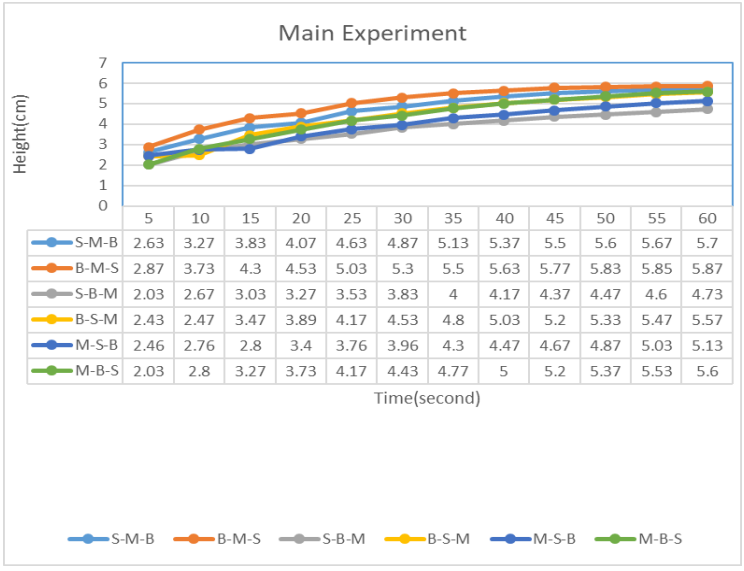
④Put 300ml of water in and measure the water level for 60 seconds every 5 seconds.　↓Figure2

3. RESULT



	5	10	15	20	25	30	35	40	45	50	55	60
Small	2	2.7	3.2	3.7	4	4.3	4.7	4.9	5.1	5.3	5.3	5.3
Medium	2.7	3.7	4.4	4.8	5.3	5.4	5.8	6	6.2	6.4	6.4	6.4
Big	2	3.3	4.3	5.1	5.6	6.2	6.5	6.7	6.7	6.7	6.7	6.7

↑Figure 3



	5	10	15	20	25	30	35	40	45	50	55	60
S-M-B	2.63	3.27	3.83	4.07	4.63	4.87	5.13	5.37	5.5	5.6	5.67	5.7
B-M-S	2.87	3.73	4.3	4.53	5.03	5.3	5.5	5.63	5.77	5.83	5.85	5.87
S-B-M	2.03	2.67	3.03	3.27	3.53	3.83	4	4.17	4.37	4.47	4.6	4.73
B-S-M	2.43	2.47	3.47	3.89	4.17	4.53	4.8	5.03	5.2	5.33	5.47	5.57
M-S-B	2.46	2.76	2.8	3.4	3.76	3.96	4.3	4.47	4.67	4.87	5.03	5.13
M-B-S	2.03	2.8	3.27	3.73	4.17	4.43	4.77	5	5.2	5.37	5.53	5.6

↑Figure4

For example, S-M-B shows that from the top, the order is the small, medium and large.

4. DISCUSSION

(1)From preliminary experiment

As the size of the grain increases, the speed at which water passes is faster.

(2)From main experiment

When layers are formed according to the size of the grain, the flow of water becomes fast.

5. CONCLUSION

Our experiments are useful in the formation of soil in the park.

CONDITIONS FOR TOWELS TO DRY QUICKLY

<Focus on color and placement>

2-3 (7)
Katano Aya/Takahashi Satsuki

Abstract

We searched for a way to dry the towels faster by using the thermoregulatory function of the zebra. We devised the arrangement of white and black towels and compared the difference in the amount of water before and after drying. It was found that a mixture of white and black dried faster than the same color. However, there was no change in the dryness of what was sandwiched between white and black.

Introduction

The reason I set the theme was because I learned in a communication English text book that the black and white stripes of zebras create airflow and lower body temperature.

First of all, tentative study was conducted using 3 towels in the arrangement of ○○○, ●●●, ●○● and ○●○.

(○represents a white towel, ● represents a black towel.) This experiment was performed 3 times.(The Method is＊.)

[Reduced water content]

○●○・・・5.7g

●○●・・・5.6g

○○○・・・3.0g

●●●・・・2.8g

It seems that towels placed white and black alternately dried quickly.

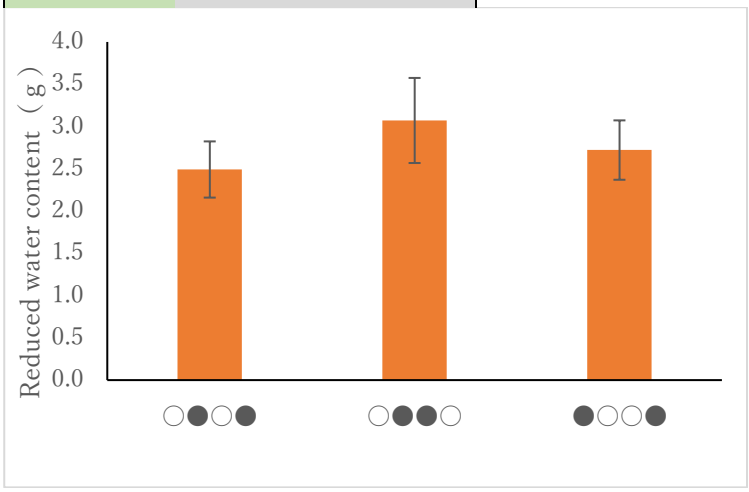
Method (＊)

Using white and black towels in a dark room that is not affected by sunlight or wind, I changed the arrangement of white and black and dried the towels. Towels were dehydrated in a washing machine so that there was no difference in the amount of water contained in the towels.

Result

	The number of data	Average (g)
○●○●	10	2.491
○●●○	10	3.1
●○○●	10	2.721

The arrangement with black in the middle was the easiest to dry.



Discussion

・We discovered a mixture of white and black dried faster than the same color was dried continuously.

・There was no change in the dryness of what was sandwiched between white and black.

Reference

Genius English Communication II
(Taisyukan Publication)

Environmental safety in Maebashi Girls High School

2-3　Group15 Momoko Arai　Naoko Soma

Abstract

In order to inspect the safety of food in Maebashi Girls High School, we researched common bacteria and colon bacillus's figure by Stamp method Bacterial test, and we inspect whether there's colony number.

Introduction

Purpose: **Investigating where and how bacteria to harm humans.**

<Used Instrument>

・MC-Media Pad[Standard agar medium & E.coli agar medium]

・Incubator

<Experimental method>

1:Dropping refine water on MC-Media Pad.

2:Sticking MC-Media Pad to spot for 10 seconds.

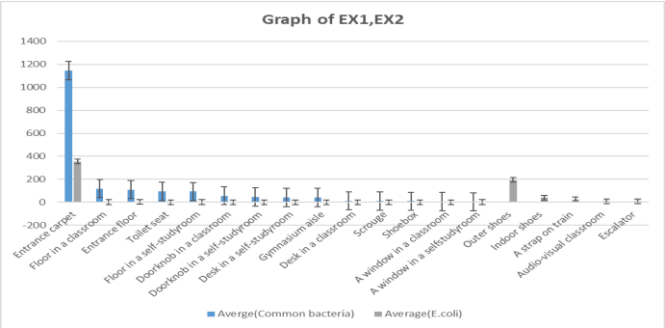
⋆the data are applied to the " Ten Cate's evaluation method" .

Results & Discussion

"Ten Cate's evaluation method"

Number of colonies	Degree of contamination
0	Clean liness
＜10	A little mild
10～30	Mild
30～100	A little severe
＞100	Severe

EX.1



Place	Average (Common bacteria)	SD (Common bacteria)	Average (E.coli)	SD (E.coli)
Entrance carpet	1145	666.8024445	355	535.1668
Floor in a classroom	119.25	61.32992744	2	1.8547237
Flooring	110.5	38.62965182	5.75	4.6368092
Toilet Seat	96	158.2891026	0.25	0.4330127
Floor in a self-studyroom	94.25	60.40436656	2.25	3.6
Doorknob in a classroom	57.25	53.45558904	0.75	0.4330127
Doorknob in a self-studyroom	47.25	66.43558911	0	0
Desk in a self-studyroom	42	47.8295585	0	0
Gymnasium Aisle	41.75	54.48449321	0.75	0.4898979
Desk in a classroom	12.25	3.418698583	1	0.7483315
Scourge	11.25	10.59186008	0	0
Shoebox	9.75	12.51559028	0.75	0.7071068
A window in a classroom	5.75	2.653299832	0.25	0.4330127
A window in a self-studyroom	3.25	0.433012702	2.5	2.4494897

These trend：The place closest to the outside & where people touched more is high adhesion rate.

Theory1：Icreasing the rate of bacterial adhesion is affected by increasing the number of contacts and the area of contact of a mediating person.

Theory2：E.coli living in soil adhers to the sole of outdoor shoes, bacteria attachment rate to the floor increases through indoor shoes.

EX.2

Place	Average (E.coli)	SD (E.coli)
Outer shoes	195	74.3404331
Indoor shoes	41.5	47.1937496
Entrance carpet	355	535.166796
Audio-visual classroom	10	5.14781507
A strap on train	26	17.39253
Escalator	9	5.612486
Scrouge	0	0

① **Indoor shoes＜Outdoor shoes…4.7 time difference**

⇔the fungi in the soil or mud sticked on the outdoor shoes propagate and spread on the entrance carpet which then carried by the indoor shoes causing the fungi to spread on the entire school floors.

②**Audio-visual classroom＜Entrance carpet…35 times difference**

>Theory2 is right.

③**Scrouge＜ A strap on the train**

>Theory1 proved to be true.

Conclusions

The floor and where people touched more are dangerous because of its bacterial adresion rate.

Washing and sterilizing hands is very important for hygiene.

References & Biography

・150147_008.PDF 浜田高校

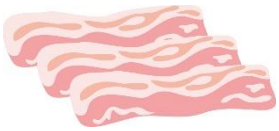
https://www.jst.go.jp/cpse/jissen/pdf/houkoku/SG150147_008.pdf

・日水製薬コスモ会|微生物検査の基礎知識

http://cosmokai.com/testingmanual/

To reduce the amount of detergent used to wash off the fat and protein stairs after grilling pork

2-4・2　Chinatsu Kishi　Ryona Fueki



Abstract

It can be described that people use a large amount of detergent.
To address this problem, we did the experiments that we washed off stains by using something instead of detergent.
As a result, we were able to find a more environmentally friendly way to wash off stains.

Introduction

(1) Reason
We were interested in our daily life.

(2) Hypothesis
① We can reduce the amount of detergent by soaking a pan of pork in hot water because the fat of pork melts at 28℃-48℃.
② We can reduce the amount of detergent by using something other than detergent because we don't have to use detergent to wash off stains.

Methods / Research

① 1,Bake the pork in a pan for 3 minutes.
2,Put 200ml of hot water at 28℃,48℃, and 68℃ in a pan and leave it for 5 minutes.
3,Wash it without detergent.
4,Wash it with detergent if the stains were washed off.

② 1,Bake the pork in a pan for 3 minutes.
2,Use flour and vinegar instead of detergent to wash off stains.
・flour : water =10:100&10:50(ml)
・vinegar = 20,30,40,50(g)

Result

①	28℃	48℃	68℃
first	Hard to wash off	Completely washed off (without detergent)	Washed off a little
second	The same	The same	Completely washed off
third	The same	The same	The same

②	flour	vinegar
first	Hard to wash off	Easy to wash off
second	The same	The same
third	The same	The same

Conclusion

・It was effective to soak a pan in hot water at 48℃.
・It was best to use vinegar instead of detergent.
・It seems that the combination of hot water at 48℃ and vinegar is the strongest.
・We wish our research could have a positive impact on the environment.

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https://kurashinista.jp/column/detail/4844
https://hama73.com/archives/3743
https://yourmystar.jp/relivers/pot-burnt-how-to-drop/

To stop the stream of the smoke

～the cigarette smoke from smoking area at Maebashi station～

2-5-6　Kotone Mogi・Manae　Yone

Abstract

To discover ways to stop the stream of the cigarette smoke from the smoking area at Maebashi station, the experiment was to spread smoke of incense sticks as cigarette smoke into the model of smoking area. Building like the eaves is the best way to avoid none smokers inhaling the cigarette smoke. Our hypothesis is right

Introduction

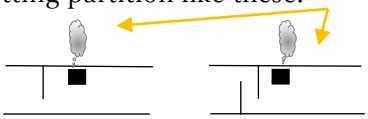
【Purpose】

The smoke of the cigarette sometimes makes us uncomfortable. Smokers have the right to smoke but also none smokers have the right not to smoke. Reducing the smoke of cigarette without much money or big facilities is necessary. This time the smoking area at Maebashi was used for the experiment.

【Hypothesis】

・Setting eaves from the bus terminal to the smoking area. ← Why? Air flow along the slope. Ex) Cloud goes up along the slope of the mountain.

・Setting partition like these.



Methods

【material】

・The model of smoke area from styrene board

・Incense sticks　・A fan to make wind

・Anemometer　・Camera

【Experiment1】

1	No wind	Nothing
2	〃	A partition
3	〃	Two partitions
4	〃	Eaves
5	〃	Eaves and two partitions

【Experiment2】

3	No wind	Two partitions
3a	1.0 m/s	〃
3b	2,0m/s	〃
5	No wind	Eaves and two partitions
5a	1.0 m/s	〃
5b	2.0 m/s	〃

【Experiment3】

5	No wind	paper eaves
5c	〃	Plastic eaves

Result

【Experiment1】

1,Spread on road	2＆3,Two partition was better
	
4,Leaked from under the eaves	5,Got up along the eaves
	

【Experiment2】

3＆3a＆3b, When wind was strong, smoke flow.	5＆5a＆5b, Only little smoke flowed
 	 

【Experiment3】

5＆5c,plastic eaves could not stop smoke
 

Smoke of b was too fast to be seen.

Conclusion

- ✓ Setting eaves and two partitions is the best way.
- ✓ A wind speed is not affect the stream of the smoke.
- ✓ The paper eaves is better than the plastic one.

A survey of geothermal power generation in Gunma

2－5 Rinka Oya Aina Ishida Hinane Ogashiwa

Abstract

There are a lot of hot springs in Gunma. It can be described that Gunma has a potential that electricity can be produced by geothermal power generation, one of the renewable energies.

Now that global warming is a problem, environmentally friendly power generation should be used efficiently. To address these problems, we researched whether we can build a geothermal power station or not, in terms of the mechanism of geothermal power generation and Gunma geography.

Methods/Research

We researched the following two things, using books and Internet.

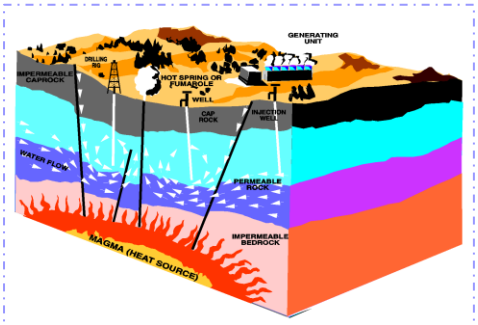
1 The mechanism of geothermal power generation
2 Geographical conditions of Gunma and geothermal power generation

Note: We do not consider the effect on ecosystems.

Result

Ⅰ) The mechanism of geothermal power generation

Natural steam generated from the heat of to turn a turbine. There are two major systems：Flash method and Binary method. The former uses hot water at 200℃ or above, while the latter uses at 80℃ or above. We focused on Binary method because it is suitable for hot spring area.



Ⅱ)Geographical conditions of Gunma and geothermal power generation

ⅰ) A construction project is being conducted in the south of Mt. Akagiyama.

The reasons as follows.

①There are caldera in common with existing geothermal power station.

②There are changed strata which shows signs of hot water.

③In the past, hot water at about 165℃ was found a depth of one thousand meters.

ⅱ) Other places where construction is possible.

	temperature [℃]	the volume of cooling water[10 thousand ㎥]	distance [km]	altitude drop[m]
Mt.Akagiyama	43,2	1320	0,90	144
Mt.Haruna	43,1	1220	6,0	444

Distribution map (Figure1)

Distance

＊1 <The necessary for Binary method>

- ◦sufficient hot water (80℃ or above)
- ◦cooling water (20～25℃,120t/hour)

•There is ample land,12.2 million cooling water and enough hot water can be obtained around Lake. Haruna(Figure1 and ＊1).

•The endowment of hydrothermal resource development in Gunma Prefecture(53～120℃) is 200～250kW/㎢, which is the third largest in Japan.

Discussion

From the result, it was found that a geothermal power station can be constructed in Gunma Prefecture because it meets the conditions required for the construction of a geothermal station.

Reference

「Newton」 August 15th,2012

「デジタル朝日新聞」
（www.ashahi.com）

「地熱発電の仕組み」
（geothermal.jogmee.go.jp）

「地熱発電の仕組みとは？」
（rakuene-shop.jp）

「群馬県における再生可能エネルギーの現状と課題」
（www.pref.gunma.jp）

「第6章 地熱発電の賦存量および導入ポテンシャル一環境省」 （www.env.go.jp）

「Google マップ」

A New Approach to Reduction of Cigarette Smoke

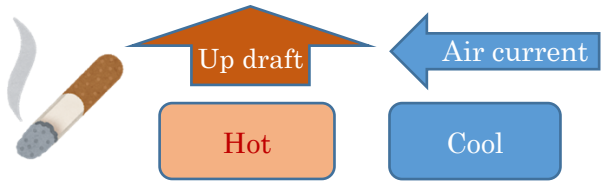
2-5 12　Miyu Shimizu　Akiho Ishii

Abstract

Cigarette smoke is harmful to the health. Generating air current by making gaps of temperature is suitable to realize the smoking area outside that takes non-smokers into consideration from the viewpoint of expenses to set up it and prevention the spread of infection of COVID-19. From results of experiment, we can say that air current can be generated by making gaps of temperature in corrugated box.

1. Introduction

We feel discomfort with the smell of cigarette smoke when we walk near the smoking area in front of Maebashi Station and cigarette smoke is harmful to our health.



To create the smoking area and the community that takes everyone into consideration, including smokers, generating air current by making gaps of temperature is useful.

2. Methods

(1) Research of the range of rising temperature of material

(2) Research whether air current is generated by making gaps of temperature in corrugated box

1. sunny place or shade
2. color of the bottom [white or black]
3. material of bottom [artificial turf or soil]

3. Result

(1) Sunny place and Shade

	Sunny place	Shade
Beginning(℃)	19.6	19.6
10minitue later(℃)	54	22.3
time(no light)	0:41	0:05

Table1 the change of temperature and time that smoke flows

(2) White or Black

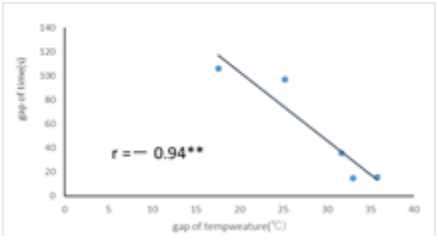
	Black	White
beginning(℃)	16.8	16.8
10minitue later(℃)	92.6	57.6
time(light)	1:30	0:00
time(no light)	0:49	0:34

Table2 the change of temperature and time that smoke flows

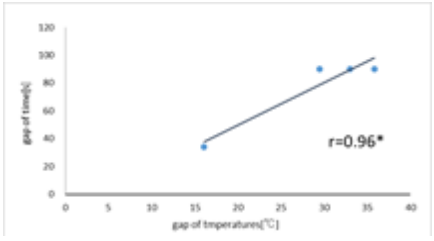
(3) Artificial turf or Soil

	Artificial turf	Soil
Beginning(℃)	18.3	18
10minitue later(℃)	102.4	86.4
time(light)	1:08	0:34
time(no light)	0:31	0:51

Table3 the change of temperature and time that smoke flows



Graph1 the correlation between gaps of temperature and time (no light)



Graph2 the correlation between gaps of temperature and time (light)

4. Discussion

From results that time that smoke flows towards side which the temperature is high is longer, it can be said that air current can be generated by making gaps of temperature. The trend that the case of light is stronger than the case of no light. Difference of the case of no light is smaller than the case of light. It is because that the temperature of no light dropped more than that of light and gaps of temperature become small.

Investigate changes in temperature and humidity inside masks depending on the materials of the masks

2-6 (14) Kitazawa Miki, Ichikura Nao

Abstract We used three types of the mask and researched the temperature and humidity change to make our mask life comfortable. Their change in this order. **Cotton→Polyester→Non-woven**

1. Introduction

(1) background

We think that we want to make our life comfortable by putting on the masks suitable for each seasons, preventing expansion of the infections disease.

(2) hypothesis

Cotton→Polyester→Non-woven

⇒the temperature and humidity variation inside the masks after putting on them

2.Methods

(1)the used things

・three types of the masks ・timer

・thermo -hygrometer

top : **cotton**(cotton100%,double gauze)
middle : **non-woven**
bottom : **polyester**(polyester95% ,polyurethane5%)

(2)experimental procedures

1. put on the masks without breathing
2. carry out according to the conditions
3. stop breath and gauge the temperature and humidity in 3second by entering thermo-hygrometer from side of the masks

Condition

① read aloud in 1minute
② breathe by the nose in 1minute

3.Result

RH[%]	cotton	polyester	non-woven
①	21.5	14.4	14.1
②	23.2	16.6	11.6

TEMP[℃]	cotton	polyester	non-woven
①	0.48	0.39	0.27
②	0.37	0.52	0.27

(the amount of increase in temperature and humidity inside the masks)

・**Cotton→Polyester→Non-woven**
The temperature and humidity change in this order.

・condition ② is more variable than condition ①

・the temperature change is different from each materials

4.Discussion

・looking at the whole, the temperature and humidity change in next order
Cotton→Polyester→Non-woven

・it is easy to change the temperature and humidity when breathing by the nose rather than reading aloud

・the air in the masks is not muffled, because the air escape easily with the momentum of making a voice

The least amount of detergent that completely removes dirt

2－7－13 M.ando N.nakajima

Abstract

An experiment was conducted with the desire to know the minimum amount of detergent that would remove stains to prevent overuse of detergent. The results showed that 460 microliters completely removed the dirt.

Introduction

(１)Purpose

I wanted to find out the right amount of detergent to use to prevent overuse of detergent and reduce the harm to the environment.

(２)Hypothesis

The stains are completely removed when the recommended amount(750μl/l)written on the detergent bottle is used.

Research

(１)The time to completely remove dirt was investigated when experimenting with a guideline amount.

Method：①The dishes were lined with a 5 cm line with a thick Mckee and patted with a detergent solution at a concentration of 750 μl/l with as little pressure as possible with a sponge.

②The time to completely remove the stains was visually examined.

	1st	2st	3st	4st	5st
time	16s	16s	15s	15s	15s

(２)As a result of the investigation in (１),
The minimum amount of detergent that can completely remove stains was investigated in 15 seconds.

Method：③The minimum amount of solution that could completely remove stains was determined in 15 seconds by varying the concentration of detergent solution under the same condition as ①.

④The experiment was repeated 4 times for each solution volume.

←0 μl

←200μl

←400μl

←440μl

←460μl

←600μl

Result

The result of (１)was calculated to be 15 seconds on average. And the experiment of (２)was performed using the result. In the experiment(２),as shown in the above picture, the stain was completely removed at 460μl/l ,and the stain was visually confirmed at 440μl/l ,so the minimum amount of detergent that can completely remove the stain on the dish is 460μl/l.

Material that does not allow ultraviolet rays to pass through

2－7-14　Nao Takahashi　Chizuru Matsuura

Abstract

By using nature the color of banana changes when it gets tanned, we found out 4 kinds of materials that does not allow ultraviolet rays to pass through.

1 Introduction

(１)Purpose

We often go out and active in the sun at clubactivity. So, the probility of getting skincancer is increase. Therefore we wish if we could prevent ultraviolet rays by founding material that does not allow ultraviolet rays to pass though.

(２)Hypothesis

1 .polyester　　2.nylon　　3 .4. linen ,cotton

1 .polyester and nylon are made of synthetic fiders and are artificially made with on emphasis on functionality. So we thought they are prevent ultraviolet rays than natural fiber such as linen and cotton.

2 .Polyester fiber have nature which prevent transparent of visible light .so, we thought polyester is the most difficult to through ultraviolet rays.

2 Methods/Research

First,wrap two pieces of polyester,nylon,linen,and cotton cloth around one banana.

Next,place the banana in direct sunlight for 8hours a day for 3days. The darker the banana color, the more ultraviolet rays pass through.

picture1

3 Result

1.　polyester 2.nylon 3.cotton 4.linen

nylon　　**polyester**

cotton　　**linen**　**picture2**

4 Conclusion

Polyester has heat resistant properties and is resistant to sunlight.

Heat resistant temperature of polyester fiber

Heat resistant temperature	Softtening point	230~240℃
	Melting point	255~260℃
Weatherability	Intensity hardly decreases even with long term exposure to the outside air.	

From the above, polyester is the most effective considering the surburn caused by ultraviolet rays and the future impact of it.　But, the ease of passing ultraviolet rays may have chanced depending on how the clothes is folded. So we would like to make it an issue for the future.

References

What condition to keep congelation of WATER TO GRAB

～Observe how to make～

2—1　group6　Haruka Kato　Ai Suzuki

【Incentive】

Now, the glove needs us to reduce plastics. Then, what should we do to reduce plastic bottles? Therefore, in this study, we researched how to exploit WATER TO GRAB.

【Material and Introduction】

●What is WATER TO GRAB?

It was made for the purpose of using as an alternative to plastic bottles.

●Materials

A ; Sodium alginate　(1.00g for 200ml of water)

B ; Calcium lactate　(1.25g for 200ml of water)

【Method】

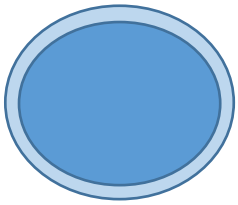
1．Dissolve A/B in each water.

2．Heat up a mixture of water and B to 10/20/40 degree.

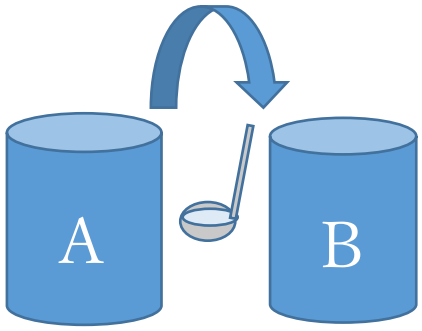
3．Soak a solution of A to B for 10 minutes.

4．Close a lid and leave it in an area out of direct sunlight.

5．Weight it after 5min/1h/2h/5h/6h.(each 9 times)



WATER TO GRAB

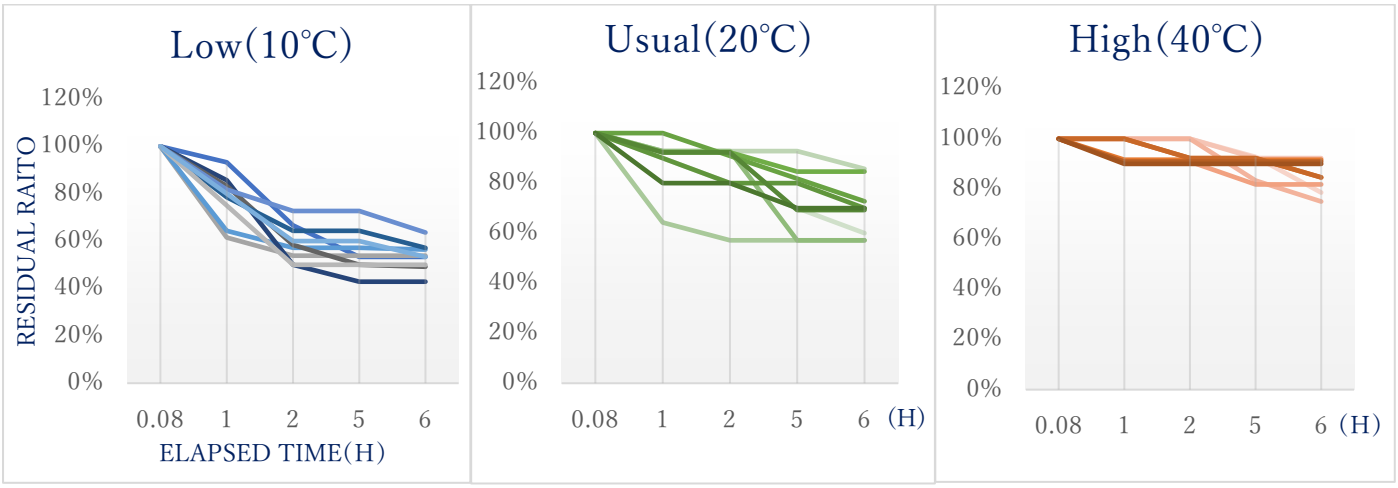


【Result】

・Low ➔It is difficult to make shape.

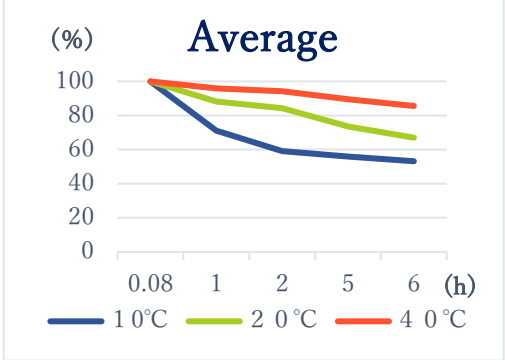
・Usual ➔The film is easy to be claved.

・High ➔rate of decrease is the lowest of the three.



【conclusion】

WATER TO GRAB made at high temperature is far tougher than others. Thus, it made at high temperature leads to exploit something.



【References】

・https://selfshot-digi.com/?p=1767

Ooho 's strength and practicality

2－1⑦ Moka Takahashi Hisaki Murata

Abstract

Ooho is mass covered with film made by sodium alginate and calcium lactate. It is expected to help to solve problem of waste and global warming. So we conducted experiments with Ooho focusing the strength and practicality.

1, Introduction

The hypothesis we set up is that the longer sodium alginate aqueous solution was kept in calcium lactate aqueous solution, the stronger the film become. This is from mechanism.By soaking longer incalcium lactate aqueous solution, sodium alginate including Ooho is connected with calcium lactate. Therefore, the film of Ooho becomes stronger because the film got thicker.

2,Methods/Research

<Method>

Step1:MakeA(=sodium alginate aqueous solution)

Pour 1.00g of sodium alginate into the 200ml of water and mix them.

Step2:MakeB(=calcium lactate aqueous solution)

Pour 1.25g of calcium lactate into the 200ml of water and mix them.

Step3:PourA into B

Step4:Observation(Experiment 1)

We observed the progress of the strength getting higher, changing the time to keep it in: for 10minutes, 3.5hours,and 7.5hours.

Step5: Observation(Experiment2)

We observed the progress in the inside of the film, changing the time to keep it in: for 10 minutes, 15minutes and 20minutes.

3.Experimental result

In experiment1, we found that the longer the alginate aqueous solution was kept in calcium lactate aqueous solution, the thicker the film became and that when this was done for more than three and a half hours, the water inside the film was solid. This means that keeping it in for a certain period of time just helps the film strength improve, but keeping it in for more than three and a half hours causes the whole Ooho including the inside to the solid, which is not practical.

In experiment2, we found when sodium alginate aqueous solution was kept in calcium lactate aqueous solution for 20minutes the condition of both the film and the inside was suitable for practical applications. Although there are some problems such as its hygiene and long-term strong we should tackle.

①	10m	3.5h	7.5h
State of Ooho			

②	10m	15m	20m
State of Ooho			

4.Discussion

As a result of our study, it was found that soaking in calcium lactate aqueous solution for 20minutes was the best for practical use. However, Ooho has still matters from viewpoint of preservation or sanitation to use on a daily basis. We would need to consider focusing on these point next. We believe Ooho will be one of the effective measures to reduce the use of single use of plastics, including plastic bottles.

Relationship　between jam and sugar content

2-1-13 Fukamachi Wakako,Tsurugi Seika

Abstract

Now, most of jam contains a lot of sugar. But, sugar is not good for health. So, we wanted to make use of fruits's sweetness and make a jam by using banana, apple, orange, kiwi and lemon, vinegar, mirin.

1. Introduction

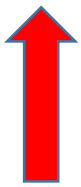
Fruits: ***banana, apple, orange, kiwi***

Seasoning: ***Lemon, vinegar, mirin***

……

<Sugar content of fruits>

1. banana
2. apple
3. orange
4. kiwi



……

・Lemon and vinegar contains acidity. They are used to　add acidity.

・Mirin contains 40% sugar. It is used to add sweetness.

2. Methods/Research

❶ Put crushed fruit in the beaker

❷ Add up to 50ml of water

(add seasonings)

❸ Measure sugar content

❹ Heat the beaker 3 minutes and cool for 1 and a half

Minutes

❺ Measure sugar content

❻ Compared the sugar content before and after heating

3. Result

《Comparision of sugar content of jam before and after heating》

	banana①	banana②	banana③	apple①	apple②	apple③
before	4.4	9.6	8.8	8.9	10.8	10.4
after	5.7	10.1	10.5	9.6	11.3	10.5

	orange①	orange②	kiwi①	kiwi②
before	9.2	5.7	9.6	12.6
after	9.3	5.2	9.5	13.1

<Figure 1. Jam with water and fruit>

・After heating, the sugar content of banana and apple, which is high sugar content jam, increased.

・On the other hand, the results of the sugar content of orange and kiwi, which is low sugar content jam, differed depending on the experiments.

……

lemon	apple	kiwi	banana
before	10.9	12.2	20.3
after	10.8	12.5	29

vinegar	apple	orange①	orange②	kiwi	banana
before	10.5	8	8.6	8.5	15.3
after	10.5	8.2	8.2	9.5	16.6

mirin	banana
before	21.5
after	20.6

<Figure 2. Jam with water and fruits, seasonings>

・The sugar content of apple jam with seasonings did not change.

・The sugar content of kiwi with seasoning increased.

4. Conclusion

・The higher sugar content of fruits is, the more the sugar content of jam increase.

・Adding seasonings containing acidity dose not always reduce the sugar content.

・We can not find the regularity for each seasoning added.

Prevent discoloration of apples

2-3（12）Ayu Suzuki　Hikari Matsumoto

Abstract

We observed the difference in discoloration due to the difference in solute, with the aim of finding a way to prevent discoloration of the fruit. As a result, honey was the most effective.

Introduction

The purpose of study is to help other fruits by knowing the cause of discoloration and finding ways to prevent it. Apples soaked in the water with lemon juice are the most effective in preventing discoloration.

Methods / Research

Water 200g , Two apples

Solute 0.5g

(**salt, lemon juice ,honey ,water**)

1. Put cut apples (2/6) in each aqueous solution and soak for 5 minutes.
2. Remove the apples from the water and observe the discoloration for 3 hours.

＊Apples that are not soaked in the water are also observed.

3. Find out how much the apples has discolored.
4. The potatoes are operated in the same way.

<Reasons for choosing solute.>

Lemon juice

Vitamin C contained in lemon reacts with oxidation before apple polyphenol.

Salt

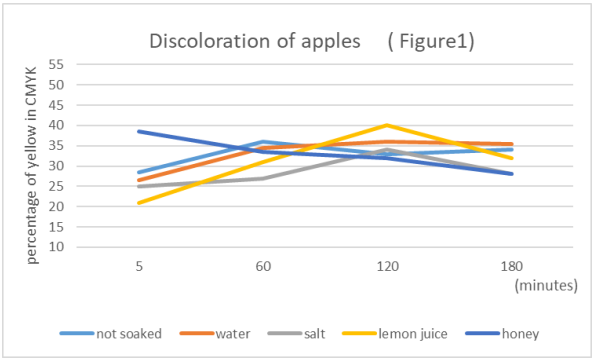
Sodium ions form a wall around polyphenols suppressing the action of enzymes and preventing oxidation.

Honey

Keep the surface of the apple out of contact with the enzyme.

Result

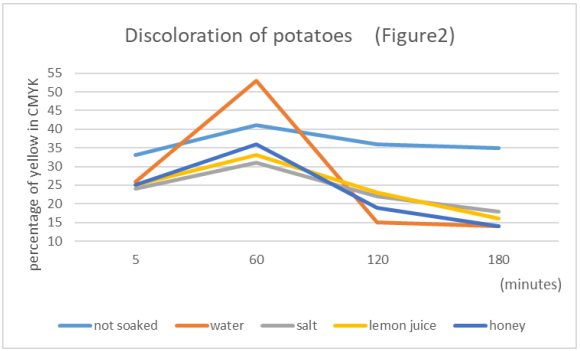
Figure1,2 shows that the average value of discoloration of apples and potatoes in yellow of CMYK.



・It was honey that had the largest decrease.

・It was lemon juice that had the largest increase.

・Salt and honey were smaller numbers than apples.



・It was water that had the largest decrease.

・It was not soaked that had the largest increase.

・The other four were smaller numbers than apples.

Discussion

Unlike the hypothesis, the most effective is honey, not lemon juice. Therefore, in this experiment, it is considered that the high viscosity of honey is more useful for preventing discoloration than vitamin C in lemon juice.

Reference

味の農園 https://www.ajfarm.com/4188/

野菜と果物の変色は空気が原因?

https://www.olivehitomawashi.com/column/2018/09/post-3052.html

Removing stains of oil-based pen with lemon

2-4-4　Ayaka　Hosoi　　Hikari　Ono

1.Abstract

It can be described that chemical detergents aren't good for our environment. To address these problems, we tried to remove the stain of oil-based pen with natural material like fruits and vegetables. We evaluated using raw lemon peel is the best way.

2. Introduction

First, we tried to remove the stain of oil-based pen with some kind of fruits and vegetables. And we found that a lemon is the best for removing in the preliminary experiment.

3.Methods

i . Write　1 ㎠　squares on a clear file with an oil-based pen.(Picture1)

ii . Scrape them and remove the stain by the following ways.

A) The outside of lemon skin.(Picture2)

B) The heated outside of lemon skin. (Picure3)

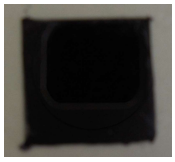
iii . Soak the clear files in three kinds of lemon and water.

C) Lemon　Juice

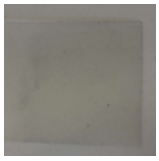
D) The outside of lemon skin.

E) The heated outside of lemon skin.

F) Water



Picture1



Picture2

Picture3

4 .Result

A・B)Raw lemon removed about 91% of dirt, the best.　(Figure1)

C~F)Raw lemon was the best, and the longer it was applied, the better it removed the stain.

The effect of removing the stain of the heated lemon skin became less effective over time.　(Figure 2)

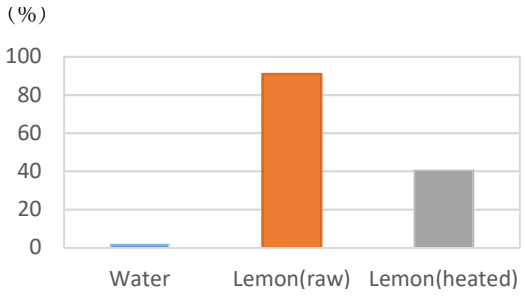


Figure 1

Percentage of each substance removing the stain

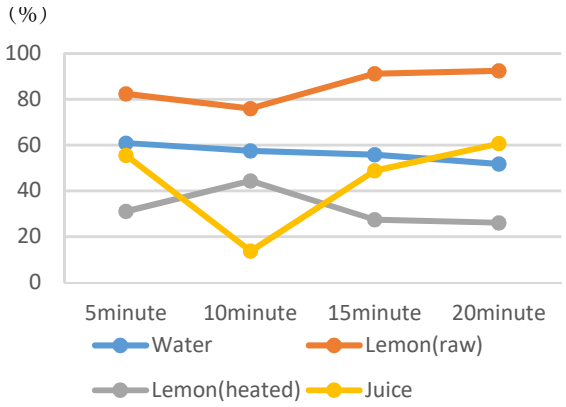


Figure 2

Relationship between the rate at which each substance removes dirt and the soaking time.

5 .Discussion

Raw lemon peel is the most effective in removing the stain of oil-based pen. By soaking, ingredients penetrate and make them easier to remove the stain.　Heated lemon skin cannot clean as well as raw lemon skin. It is considered that the components were mutated by heating.

Changes in the sugar content of bananas due to preservation methods.

2-4　11　Miku Ishibashi　Nanami Kouno

1,Abstract

Ethylene gas is said to promote banana aging.
We investigated changes in banana sugar content due to methods of preservation using ethylene gas.

2,Introduction

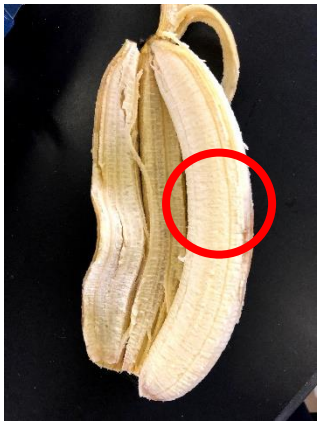
We thought that knowing the best time to eat food would help me to taste the food and reduce food loss.
We assumed that bananas preserved at room temperature and put in paper bags with apples had the highest sugar content. (apples emit a large amount of ethylene gas.)

3,Methods/Research

The storage method was divided into the following four parts.

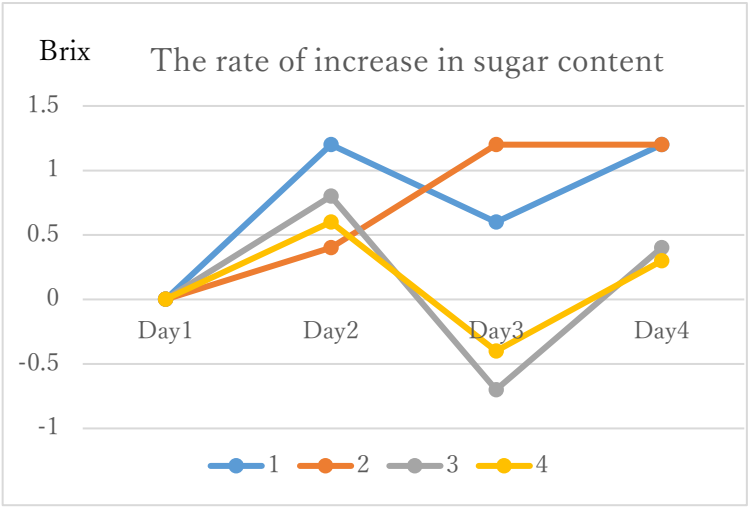
(1) Bananas left unattended at room temperature
(2) Bananas and an apple in a paper bag at room temperature
(3) Bananas left unattended in the refrigerator
(4) Bananas and an apple in paper bag into refrigerator

The sugar content was measured for four days once a day for bananas preserved in the following ways (1)~(4).
Bananas were measured with a sugar meter after crushing the center.



4, Result

As a result of the second experiment, the sugar content of bananas in 3 and 4 did not change much, and the sugar content of 1 and 2 increased by 1,2 degrees.



All experiments showed that storing bananas in paper bags with apples increases the sugar content the most.

5,Consideration

It is thought that the reason why the sugar content of refrigerated bananas was difficult to increase is because the temperature was low and aging was suppressed.
There are two possible reasons why there was no difference between a banana in a paper bag with an apple and a banana as it is. The first is that the amount of ethylene gas emitted from apples was small. The second is that the paper bag is not completely sealed and the gas has gone out of it.
From now on, we would like to investigate changes in banana sugar content caused by ethylene gas using containers with higher sealability.

6,Referance

「果物情報サイト　果物ナビ」
https://www.kudamononavi.com/columns/view/1

Conditions for tomatoes which feel sweet

2－4 Haruna Hagiwara　Masumi Takegoshi

Abstract

We examined conditions for tomatoes which feel sweet. By learning how to distinguish delicious tomatoes through this study, we thought we could reduce food loss and make use of it in our future diet.

1.Introduction

The purpose of this study is to find some tomatoes that taste sweet and some that taste sour even if we eat the same pack of tomatoes, and we wonder what they are.

We predicted that redder, better-shaped, smaller tomatoes taste sweet because we often feel so and found out these conditions by looking into it.

2.Methods

We examined pH and the sugar content of tomatoes under 3 different conditions

① To investigate the color of tomatoes

Prepare 3 different color tomatoes with similar shapes and sizes (deep red, bright red, bluish red)

② To investigate the shape of tomatoes

Prepare 3 different shape tomatoes with similar sizes and color (elongate, crushed, rounded)

③ To investigate the sizes of tomatoes

Prepare 3 different sizes　tomatoes with similar color and shapes.

We repeated each of these experiments twice.

Different shapes

Different colors

3.Result（We averaged these 2 experiments.）

	deep red	bright red	blush red
size(cm)	6.6	6.3	6.5
the sugar content(%)	5.9	6	4.9
pH	3.11	3.52	3.36
(%)/pH	1.9	1.7	1.46
taste	○	△	△

The result of ①

	elongate	crushed	rounded
size(cm)	6.2	6.7	6.4
the suger content (%)	5.6	7	7.8
pH	3.67	3.52	3.47
(%)/pH	1.53	1.99	2.25
taste	△	△	○

The result of ②

	A	B	C
size(cm)	6	6.5	7.3
the suger content (%)	5.8	4.7	6.7
pH	2.98	3.17	2.97
(%)/pH	1.95	1.48	2.26
taste	△	△	◎

The result of ③

4 .Discussion

・　①Deep red　②Rounded　③Biggest

are conditions for tomatoes which feel sweet.

・Sugar content is not the only thing that has to do with the palate feeling.

・ We want to obtain more accurate experimental result by examining with an acidity meter, not with a pH meter.

【Reference :上手な選び方（きよみ）　www.maff.go.jp】

How do the materials which have antibacterial properties control multiplication of colon bacillus?

2-5 Group20 Mio Shibusawa , Haruna Uchida

Abstract

We examined about the materials which have antibacterial properties control multiplication of colon bacillus. And we used vinegar, mustard and wasabi. We did our best. But our experiment went wrong. So we want you to listen to on the assumption them.

Introduction

Background:

At present, antibacterial is attached importance to in pandemic.

So we wanted to examine about antibacterial properties with immediate foods.

Hypothesis/Prediction:

wasabi>vinegar>mustard

(These show a large of antibacterial properties.)

Inspection plan:

① Thirty agars were made. And for the purpose of making the basis colon bacillus, colon bacillus which stuck to our fingers were applied to two agars.

② Colon bacillus was moved to the other twenty-eight agars.

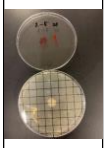
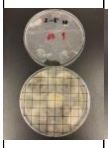
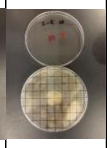
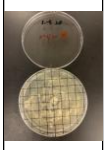
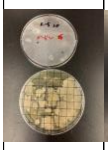
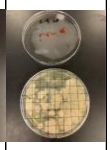
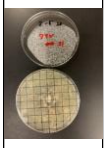
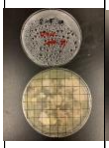
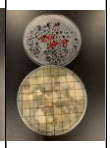
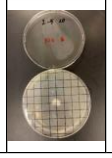
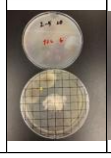
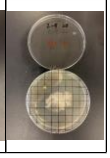
③ The *solution was applied. The solution was made by vinegar, mustard and wasabi to agars with encircling the center germs.

*solution
- vinegar:refined water=1:1
- mustard:refined water=1:1
- wasabi:refined water=1:1
- /0.5ml at a time.

④ We observed how colon bacillus had grown in a device which was kept at 37.0℃. And we took pictures it.

＊ Each lids which are written square are changed each time.

Result

	Day1	Day2	Day3	Day4	Day5	Day6
Vinegar		×	×	×		
Mustard		×	×	×		
Wasabi		×	×	×		
Nothing		×	×	×		

Day1:Saturday
Day2:Sunday
Day3:Monday(holiday)

Discussion

As a result, due to mold, our experiment ended in failure.

＜The reason why our experiment field＞

Because1:We did not observe second, third and fourth day.→We did not see when mold had grown.

Because2:Mold had grown.→Dust in air entered when we took pictures(?) And solutions in petri dishes were put at the place of warm and wet.

＜The application to real life＞

We recommend to apply to tableware and so on which cannot use ethanol to eat at the place of cool and low humidity.

How to preserve mixed seasoning longer

2 － 6 [Group9] Shino Matsushima Ririka Yada

Abstract

We studied combination of seasoning which can be kept for a long time. We thought single seasoning could be kept for a long time and go bad about 1 week once; they are exposed to the open air. Seasoning were sprinkled on ager medium. 37°C, bacteria bred excepting vinegar. At refrigerator temperature, bacteria did not increase with all seasoning. Therefore, seasoning do not affect bad influence by bacteria in case they are with vinegar or preserved in refrigerator.

Introduction

[Purpose]

We thought if we find mixed seasoning that can preserve for a long time, cooking would become easier. In addition, we would enjoy it.

[Hypothesis]

・Seasoning would be gone bad for 1 week.
→Recipe books say that we should use it in 1 week.
・A single seasoning would be able to be kept for a long time.
→A lot of seasoning can save at normal temperature and their use-by date are very long.

Method

1. Each seasoning was weighed 50ml at a time.
2. These were made touch the air for 5minutes.
3. Ager medium was made, and various kinds of seasonings, weighed 500μl or 1000μl, were spread.

＊1day, 3days, and 7days after placing them in the refrigerator, they were placed on ager medium and kept for another week.

[Experiment 1]

Ager medium with seasonings were kept 37°C in the incubator.

[Experiment 2]

Ager medium with seasonings were kept 5°C in the refrigerator.

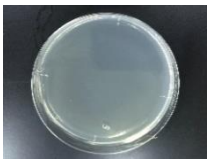
〇bacterial breeding was observed.

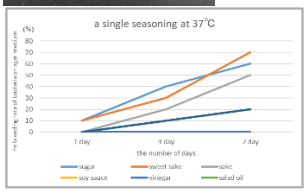
Result

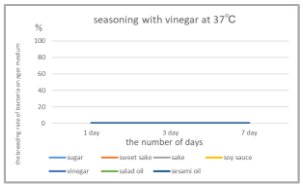
[Experiment 1]

Bacteria propagated in sugar water, sweet sake for seasoning, soy sauce, cooking alcohol, salad oil and sesame oil.

・Vinegar had no change.
・Mixed seasonings with vinegar had little change.

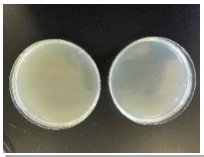


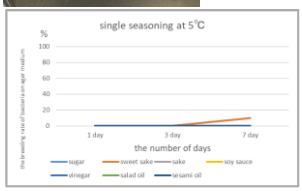


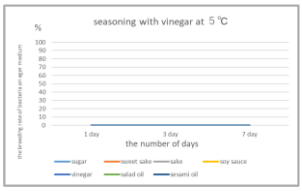


[Experiment 2]

・Every seasoning had no change.







〈These are pictures of experiment using sake.〉

Discussion

・We should use for a week because seasonings will start rotting or oxidizing.
・Mixed seasonings with vinegar can be kept for a long time.

Conclusions

・Places with high temperature is easy for bacteria to propagate.
・There is nothing better than seasonings kept in a cool.
・Mixed seasonings with vinegar can be kept longer.

References

・食は健康の拠り所！伝
・あわせ調味料基本のレシピ
・味つけの法則

Changes in drinks before and after the expiration date

2-7-17 Mina Yamada Mana Mizukoshi

Abstract：We thought that the sugar content of the drink would decrease when the expiration date expired , but there was no changes. However, it was found that the acidity became stronger when the, drink was stored at 20℃,which was the same as the storage method. It is important to store food properly.

1. Introduction

(1)Purpose：Know the change in taste of expired drinks.

(2)Hypothesis:①Since it is against the storage method, the value may drop significantly at 20℃.

②The value may drop significantly if the package is opened because it comes into contact with the air.

③Since it contains lactic acid bacteria , the number may drop significantly for lactic acid bacteria beverages.

2. Method/Research

Conditions①：Change the temperature during storage.

↓

Store lactic acid drink at 5℃ and 20℃.

②：Unopened or opened.

↓

Store at 5℃

③： lactic acid drink and apple juice

↓

Store at 5℃ each.

⬇

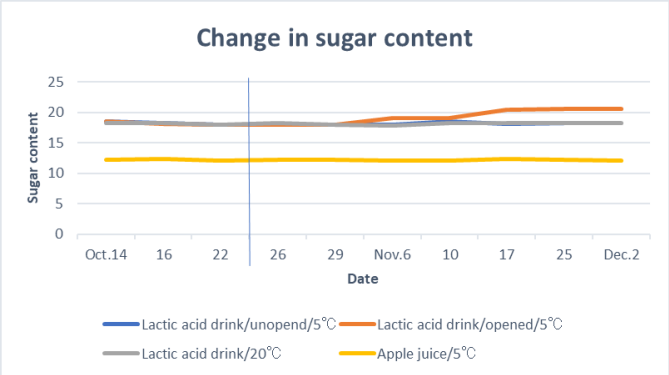
Measure with a sugar content meter.

Apples:11 days before the expiration date to 37 days after it.

Lactic acid drink:9 days before the expiration date to 40 days after it.

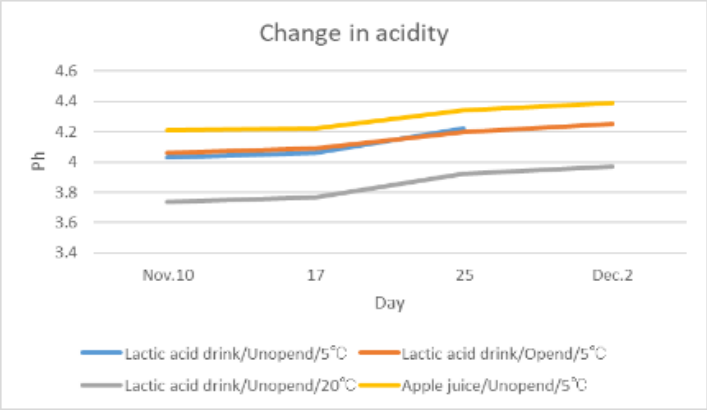
3. Result

There was no significant change in sugar content under any conditions. Therefore, the acidity of the lactic acid beverage 18 days after the expiration date was measured with a pH meter. As a result, the pH of only the lactic acid beverage stored at 20℃ changed significantly to about 0.3.



Lactic acid drinks： Best-by date Oct.23

Apple juice： Best-by date Oct.25



4. Discussion

Even if the expiration date expires the taste will not change if it is stored properly, but if it is stored in a warm place, the acidity will become stronger.