

Kitchen Science

Ameya and Lavanya are classmates. It is Lavanya's birthday. She had dared him that he would not be able to make a new dish every week. Especially in their hostel which has limited cooking facilities. He has taken up her dare and is convinced that he can prepare something to eat or drink even in hostel. Ameya is interested in chemistry and biology and knows a lot about the science of cooking. Lavanya knows a lot about technology. Through this series the viewers learn that there is a lot of science and technology behind cooking.

Episode 1

Going Bananas

LAVANYA is sitting at the canteen listlessly stirring the food on her tray. She has very little food on her tray in comparison to all the loads of food her friends are eating heartily.

Lavanya is sitting at a desk sobbing. She hears a noise of people coming and starts wiping her tears hastily and arranging her books.

AMEYA and ANKUR enter the room. Ameya has Quantum Physics book in hand and Ankur has Economy books in hand. Ankur looks at her and sees the tears. In expression asks Ameya what is happening. Ameya points to Ankur the book that Lavanya is trying to hide under her quantum Physics book. Side binding shows the book label - "Moms Cookbook". He rolls his eyes.

AMEYA

What are you doing with a cookbook? Don't you have a class on quantum physics today? Did you forget that the final selection for the quiz starts in about 2 hours!

Lavanya puts cookbook down and she shudders- in an attempt to stifle a sob. She strokes the cookbook lovingly.

LAVANYA

Oh! I remember. It's just that I hate the food in this hostel! And there is not even a gas stove, where we can cook our own food!

AMEYA

Who said we can't cook food in this hostel? It may not be possible to cook everything- but at least we can cook some dishes even in these facilities.

Lavanya is talking while thinking of mom serving nice dishes on the kitchen table. Shakes head to say that this is not possible in hostel.

LAVANYA

Ya, ya, ya! What do YOU know about cooking. It is not as though you guys can even boil a potato! You probably don't even know to light a stove!

Ameya has put bag down on table and is opening bag. Points finger at himself and points to the cookbook in a challenging manner.

AMEYA

What do you mean that we can't cook! Of course we can.

Lavanya is getting up from sofa. Coming toward Ameya.

LAVANYA

O.K. I dare you to prepare some dish every week this month then.

Ameya takes books out of bag and bangs them on table.

AMEYA

Done deal. **(Bang)** Every Saturday this month I will have some drink or dish made by my own hands.

Lavanya shrugs and raises eyebrows and writes on calendar 'Ameya cooks Saturday'.

AMEYA (Cont'd)

But if I win- **(points finger at Lavanya and shows her the calendar- writes 2**

months Lavanya cooks) you will have to cook something every week for 2 months.

Lavanya shrugs to say OK. But points to her bike visible outside the window. Shows the bucket and washcloth in corner near bike

LAVANYA

Agreed. And if you lose- then you clean my bike for a month.

AMEYA

Agreed.

LAVANYA

(talking to herself while walking out the door)

Does he realise that there is no stove in the hostel? How does he think he will make anything to eat? With exams coming up next month where will he get the time to cook? I will win this dare this Saturday itself!

Ameya continues to stare in the direction of the door as Lavanya leaves.

INT- Makeshift hostel KITCHEN

LS- AMEYA is standing at counter busy, putting newspaper on table, taking out bowl, fork.

Hear footsteps and ANKUR enters the frame with a blender in hand.

ANKUR

(Smirking and puts blender down)

So are you going to drop science college and become a chef instead?

AMEYA

(Looks up from counter)

Why would I need to that? There is a lot of science behind cooking.

ANKUR

Science behind cooking? What do you mean?

AMEYA

(plugs in the blender)

You are an economics student. Isn't there a lot of economics behind food?

ANKUR

Well yes. There is economics of food production, food transport... and a...

AMEYA

Well... Just like that there is a lot of science behind food and cooking.

ANKUR

Really? That sounds interesting.

AMEYA

(taking out glasses)

Why don't you stay around while I make milkshakes? That's what I am making today. And I can tell you about some of the science behind it.

ANKUR

(Shrugs. Takes a seat on counter)

Sure. As long as I get to drink milkshakes at the end.

LS Two shot. AMEYA is looking around.

AMEYA

Now where are the bananas for making the banana milkshakes?

Ah! Right!

AMEYA walks out of frame and comes back with a covered bowl.

AMEYA (CONT'D)

I have some bananas
I cut this morning.

CU of Bowl. AMEYA uncovers the white bowl

ANKUR (V.O.)

Eeeewww! That looks disgusting!
All brown and stuff!

MS. AMEYA slaps his forehead.

AMEYA

Oh right! I forgot
bananas get brown when they are cut
and exposed to air!

ANKUR (V.O.)

Rusted?

**Picture of banana. It is cut. Arrows of oxygen pointing toward
banana. Brown colour develops along the exposed part of the
banana.**

AMEYA (V.O.)

Ya! When bananas are cut,
It's cells get damaged.
This allows oxygen in the air
to react with the iron containing molecules
present in the fruit.
They oxidise the iron, similar to rust,
on the surface of the banana.

CU. ANKUR looking quizzical

ANKUR

Oxidise iron? Doesn't oxidising iron
take a long time to form?

AMEYA (V.O.)

Bananas have an enzyme
that speeds the process of oxidising.

MS Two shot. On upper left corner animation of

Lots of white bananas + Oxygen-> some white bananas are turning brown slowly

ENZYME appears on arrow- all bananas on right side turn brown immediately

ANKUR

What is an enzyme?

AMEYA

Enzymes are proteins that make chemical reactions happen faster

ANKUR

I have heard adding lemon juice to cut bananas prevents them from browning.

AMEYA

That's right. Lemon juice has Vitamin C. It lowers the pH and has antioxidant properties that prevent many cut fruits from browning!

CU of ANKUR picking up banana chips from a bowl.

ANKUR

Why don't banana chips get browned? They are also cut fruits.

AMEYA

Those chips have been fried.

ANKUR thinks of bananas being fried while eating chips (Cloud on upper right side) then

CU of bananas being fried in a Kadhai on a stove.

AMEYA (CONT'D)

Heat inactivates many enzymes. Frying chips heats the bananas enough to

inactivate the enzyme that causes
browning.

**LS including table. AMEYA putting bowl of cut bananas away.
Turns around and gets a basketful full of bananas from a
shelf.**

AMEYA

We can't use these cut bananas. Let's
use these bananas.

**LS ANKUR takes a banana; MS peels one and promptly starts
eating one. Disgusted face.**

ANKUR

These bananas are not ripe! Do you have
any sugar to make the milkshake sweeter?

MS AMEYA

AMEYA

Sugar? No! I don't have any sugar. Do we
really need the sugar?

AMEYA also tastes some of ANKUR'S banana. Worried expression.

AMEYA

Oh no! Now what do I do? Where am I going
to buy sweet bananas from?
I only have 30 minutes before Lavanya
comes.

ANKUR

Don't worry. Let me check my bananas.
They were quite sweet when I ate one this
morning.

**ANKUR looks down and gets out a closed bag from which he
takes out ripe looking bananas**

AMEYA

How can your bananas be so ripe?
We bought them at the same time
from the same bunch.

ANKUR

Oh! That's because my bananas were kept in a closed bag.

I have heard that bananas that are kept in closed containers get ripe faster. I wonder why?

AMEYA

Bananas release a gas called ethylene.

Picture of a banana with arrows flowing out of it and the word ethylene

Ethylene is a plant hormone. It speeds up ripening of many fruits. It works by changing the levels of enzymes involved in ripening bananas. When it's kept in a closed container ethylene can accumulate and the fruits get ripened quickly. When bananas are kept in an open container ethylene diffuses out and the bananas do not ripen quickly.

ANKUR

But why are ripe bananas sweeter?

ANIMATION - starch molecules, amylase on an arrow simple sugar molecules, Amylase structure?

AMEYA

They have more sugar in them. Unripe bananas have more starch. Amylase is an enzyme that converts starch into simple sugars as bananas ripen. That's what makes ripe bananas taste sweeter.

MS Two shot including table

Let's mash up the bananas.

Oooff! This is really difficult to mash up!

CU of glass bowls with bananas in them being mashed up with forks.

AMEYA (V.O)

Unripe bananas have a lot of pectin,
a substance that makes fruits hard.
Pectinase is an enzyme
which breaks down pectin
to make the bananas softer.

MS of boys pouring milk from a jug.

AMEYA

Let's mix this with the milk now.
Where is the blender jar?

ANKUR

The blender jar? Oh I forgot to bring it
from the kitchen.
But why do you even need a blender?

AMEYA

The blender helps by emulsifying the milk
fats giving us the creamy consistency of
milkshakes.
And if the milk is nice and cold
it will foam up.
It will take a very long time to shake
the milkshake sufficiently if I don't
have a blender.

ANKUR

Don't worry I will bring the jar.

AMEYA

But what will I do if LAVANYA comes
before you bring the jar?
I need to show her something that I have
made.

CU of AMEYA's face

AMEYA (CONT'D)

Wait! I can make an edible candle.

ANKUR was about to leave the room but now he turns back to ask question

ANKUR

What? An edible candle?
You mean you can eat the candle?

AMEYA

Yes. It's not a real candle.
It just looks like a candle.
And it will light up for a few minutes.

ANKUR

What will you use to make the candle?

CU of candlestand.

AMEYA

See this banana looks like a candle?
I'll cut this nut to look like a wick.
With dim light it will look like a real
candle.

AMEYA places the peeled banana on the candle stand that already has some molten wax on it. And then places the nut on top of the banana. Foreground is the candle- AMEYA face in background.

ANKUR (V.O.)

Will it light up?

MS of AMEYA

AMEYA

Nuts have very high oil content
that allow them to burn for a few minutes.

ANKUR

I had better get the blender now.

**ANKUR exits out of frame. AMEYA places the wick on the candle.
ANKUR enters with blender jar in hand.**

AMEYA

Great lets blend this up quickly.

ANKUR

Is that all we need to do to make a
banana milkshake?
Just blend cold milk and bananas
together?

AMEYA

You could add vanilla essence
or cinnamon powder
or ice cream to the milkshake.
But even this tastes good.

LAVANYA enters

LAVANYA

So what have you made?
Were you able to make anything?
or have you given up on the bet?

AMEYA

Of course not! I have made banana
milkshakes.

LAVANYA

Did you know that the blender
was first developed in 1922 by Stephen
Poplawski specially to make malt
milkshakes?

**Ameya is pouring out milkshakes out of blender. Places a bendy
straw in the glass.**

LAVANYA

You know - even these bendy straws

were invented due to milkshakes.
Back in the 1930's straws were made out
of paper.
One day Joseph Friedman saw his young
daughter
struggling to drink milkshake using a
straight straw.
He put a screw inside the straw
and wrapped string around the paper
into the screw threads creating
corrugations.
When he removed the screw
the straw could easily
bend over the edge of the glass.
He patented his idea in 1937

AMEYA

(talking to ANKUR)

See food has both science and technology
behind it!

AMEYA

Wow! Blenders and flexi straws
both got invented because of milkshakes?
Maybe this milkshake will spark an idea
for some new invention by us! Maybe we
will win a nobel prize!

(Hi five with Ankur)

LAVANYA

Hear! Hear! Three cheers for our future
inventions!

AMEYA

Wait! I have a cake for you.
See... I remembered your birthday!

**Dim lights. Take out the cake along with the banana candle.
Let LAVANYA blow out the candle.**

AMEYA eats the candle much to the astonishment of LAVANYA!

FADE OUT