THE SCHOOL OF
ARTISAN FOOD

Ice Cream Making

With Sally-Ann Hunt

Classic Vanilla Bean

Ingredient	Quantity
Whole Milk	250ml
Vanilla Paste with seeds	2 tsp
Caster Sugar	150g
Double Cream	500 ml

Method

1. Whisk the milk and sugar until dissolved.
2. Stir in the cream and vanilla.
3. Chill thoroughly.
4. Pour into the churner and process until thick and creamy.

Rhubarb and Custard

Ingredient	Quantity
For Rhubarb	
Chopped rhubarb	300g
Sugar	50g
	[redacted]g
Custard Base	
Double Cream	300ml
Whole Milk	200ml
Caster Sugar	100g
Egg yolks	3
Vanilla	1tsp

Method

- **The Rhubarb:**

1. Roast 300g chopped rhubarb with 50g sugar at 180°C for 20 mins.
2. Blitz into a purée and chill.

- **The Custard Base:**

1. Heat milk and cream until simmering.
2. Whisk yolks and sugar in a separate bowl.
3. Slowly pour hot milk over yolks while whisking (**tempering**).
4. Return to low heat; stir until it coats the back of a spoon (**Nappe stage**).
5. **Do not boil.** Chill in an ice bath, churn, and ripple the rhubarb in at the very end.

Deep Dark Chocolate

Ingredient	Quantity
Whole Milk	200ml
Double Cream	400ml
Cocoa Powder	50g
Caster Sugar	120g
Dark Chocolate (finely chopped)	80g

Method

1. Heat milk, sugar and cocoa, whisking until smooth and simmering.
2. Remove from heat; stir in the chopped chocolate until melted.
3. Stir in the cold double cream.
4. Chill thoroughly before churning

The Science of the Scoop

Ice cream is a Colloid. It is a solid (ice), a liquid (fat), and a gas (air) all at the same time!

- Ice Crystals: These provide the structure. We want these to stay tiny so the ice cream is smooth and professional.
- Emulsifiers: In these recipes, Egg Yolks act as an emulsifier. They bind the fat and water together so the ice cream doesn't feel "icy" or "watery."
- Sugar: Acts as an Anti-freeze. It lowers the freezing point of water, keeping the scoop soft.
- Air: Whipped in by the machine. This is called Aeration or "Overrun."

The Science Challenge

Fill in the blanks:

In these recipes, _____ are added to help bind the fat and water together. To stop eggs from scrambling when adding hot milk, we use a technique called _____.

True or False:

- Cooking the custard base makes the ice cream smoother. (T / F)
- The faster the mix freezes, the larger the ice crystals. (T / F)
- Dark chocolate contains fats that help make the ice cream creamy. (T / F)

The Temperature Challenge: We must chill our "cooked" custard to below _____ °C before putting it in the churner, otherwise, it will melt the ice in the bowl.

Sensory Evaluation (The Taste Test)

- Appearance: (Describe the colour/texture):

  .....

- Mouthfeel: Is it "velvety" or "grainy"?

  .....

- Flavour: Is the vanilla/chocolate/rhubarb balanced? .....

- Improvement: What would you change next time?

.....
.....

The Science Note: Why Salt?

To turn liquid cream into solid ice cream, we have to perform a "heat heist"—we need to steal the heat out of the cream as fast as possible.

Pure ice melts at 0C. However, because our ice cream mix is full of sugar and fat, its freezing point is lower than water. If we just used plain ice, the ice cream would stay a liquid "soup" forever.
The Salty Solution (Freezing Point Depression):
When we add Salt to ice, it forces the ice to melt, but here is the magic: as it melts, the temperature of the salty slush (brine) drops far below freezing, sometimes as low as -10 or -20

How it works in your Churner:

1. Heat Transfer: The super-cold salt water is much more efficient at sucking heat out of your bowl than air or plain ice cubes.
2. The Anti-Freeze Battle: The salt lowers the freezing point of the ice, which allows the ice to absorb enough energy to overcome the "anti-freeze" effect of the sugar in your recipe.
3. Speed: This rapid cooling creates tiny ice crystals. If we didn't use salt, the process would be too slow, and you would end up with crunchy, gritty ice lumps instead of smooth cream.
4.

⚠ **Student Safety Warning**: Because the salt-ice mixture is much colder than regular ice, it can cause "ice burns." Never touch the salted ice or the frozen metal bowl with wet hands—your skin will stick to it instantly!

Skill	Description	Done?
Accurate Prep	I weighed all ingredients to the gram and kept the dairy chilled.	[ ]
The Tempering	I added hot milk to eggs slowly without "scrambling" them.	[ ]
The Nappe Test	My custard was thick enough to leave a clear line on a spoon.	[ ]

The Flash Chill	I used an ice & salt bath to drop my mix to 5C quickly.	[ ]
Aeration	I churned until the mix doubled in size but didn't turn to butter.	[ ]
Ripple Effect	I added my inclusions at the very end to keep them chunky/swirled.	

Notes for Ice Cream Making

Hygiene

Environmental Health see both milk and raw egg yolks as high-risk ingredients. This is because within a certain temperature scale (10°-63°C), bacteria that are naturally present in safe numbers in both ingredients can start to breed and multiply so rapidly as to become dangerous in number. The main aim and object, when making an ice cream base, is to move it through this temperature range as quickly as possible to minimise potential for bacteria growth.

It's recommended that an egg–custard be cooked to 86°C in order to thicken sufficiently and then the temperature be bought back down to 10°C within half an hour. Plunging the pan into an iced water bath can do this, and then the mix is stirred occasionally until it's cool enough to be placed into the refrigerator.

NB: Make sure the level of the iced/cold water bath reaches or comes above the level of mixture in the pan – otherwise it will take much longer to cool.
Check the running temperatures of your fridge and freezer. The fridge should be at 4°C and freezer at -18°C in order to store produce optimally.
*Equipment should be scrupulously cleaned after each use.
*Once frozen, ice cream should never be allowed to melt then be re-frozen.

Sweetness

A refractometer measures the sugar density of a given solution, or sorbet base - this will most likely be different every batch you make according to the amount of natural sugars present in the fruit. Too much sugar in your recipe means it won't freeze properly and will be runny and sticky - too little sugar and your sorbet is likely to freeze too hard and be dry and powdery.
A granita should ideally be about 5% BRIX in its liquid state and a sorbet between 21% - 28% depending on your taste.

Adding **alcohol** to an ice cream or sorbet base depresses the freezing point – i.e if too much is added the mix it'll never freeze at all. Make sure to reduce the sugar in a recipe if you wish to add an alcoholic flavoring.

Simple Syrup is a standard recipe used for both sorbets and granita. It can be made in advance and consists of equal quantities (grams / milliliters) of sugar and water.
A good basic amount to make is 500g sugar + 500ml water. Either heat the two together until the sugar dissolves, or sugar can be stirred into cold water until it dissolves. Store it in an airtight container or jam jar in the fridge.

Salt

A pinch of sea salt can help the flavour of many recipes, especially rich ones - in much the same way as lemon juice adds piquancy and balance to dishes. It's especially good with chocolate and adds a definite lip-smacking quality to strawberry ice cream.

Aging

Ice cream bases (only recipes that contain milk and/or cream) need to be 'aged' before being churned. Ideally overnight but potentially for up to 5 days, so long as they are in a sealed container and refrigerated to below 5°C. This will dramatically improve the finished texture or 'body' as the solids have time to soak up the water in the recipe. It creates a creamier and smoother ice cream and one that melts more slowly – without the need to add extra fat. Always re-emulsify the mix with a blender for a minute or two before churning in case it has separated.

Tips

When adding fruit puree or lemon juice to an ice cream base, always make sure that the two parts are the same temperature before combining, i.e. don't add a fridge-cold puree to a recently made base or there may be a danger of splitting/curdling the mix.

Don't try whisking yolks and sugar together too far ahead in advance of your milk reaching simmering point. Sugar (and salt) has a coagulating effect on contact with eggs. This will mean hard little lumps of yellow yolk in your finished custard.

If you overcook your custard, 90°C or higher, the protein in the egg coagulates and becomes grainy instead of satiny. It's possible to rectify this by plunging the pan quickly into iced water and then blitzing with a blender at the same time. Sieve lumps out and check to see if it's recovered. Never let a custard mix boil!

Equipment List

All of the following items are things I use every day and are what I consider essential for better ice cream making.

Kuhn Rikon Heart Spring Whisk

(About £15 from www.amazon.co.uk)

Great for preventing the bottom of the pan from scorching when making custards and steeping vanilla in milk.

Refractometer 0-30% BRIX

(About £99 from www.refractometershop.com)

Absolutely necessary if you want to make sorbets or granita from fresh fruits and juices on a commercial scale. (See notes)

Silicon Spatula

(Under £10 - widely available)

Really useful as they are heatproof so you can cook your ice cream base out to 82°C and it won't melt. It can also be washed at high temps so it is very hygienic. Try to avoid those with wooden handles - which aren't so easy to keep clean.

Conical Sieve or Chinois

(Around £22.99 from www.nisbets.co.uk or smaller domestic version £16 at www.johnlewis.com)

A cone–shaped fine mesh strainer is the best way of getting pips & lumpy vegetal matter out of a fruit puree or stewed fruits. Push the puree through the sieve with the back of a ladle in an up and down motion to quickly achieve a super-smooth ice cream or sorbet.

Microplane Grater #46020

The best and longest lasting grater I have ever come across. Great for zesting citrus fruits without taking away any of the bitter white pith. Perfect for nutmeg.

Stick Blender/Immersion Blender

(Several models available – from around £22)

Very handy as saves on washing up when you're blitzing your base, rather than transferring it into a jug blender - you can do it all in one pan.

Further Reading

Ice Creams Sorbets & Gelati - The Definitive Guide
Caroline & Robin Weir (Grub Street)
My first and favourite ice cream making guide, a huge range of recipes as well as more in-depth historical and scientific investigation, all written with humour & and light hand.

The Perfect Scoop
David Leibovitz (10 Speed Press)
A brilliant collection of funny and creative recipes, written by an absolute enthusiast.

The Harvest of Cold Months – A Social History of Ice & Ices
Elizabeth David & Jill Norman (Penguin)
Elizabeth David died before finishing this magnum opus, and her years of research were edited and put together by Jill Norman.
I'm still struggling through my copy – but determinedly – as it really is an extraordinary treasure on the remarkable history of the use of ice in food and drink, which we so easily take for granted now!

Ice Cream: A History
Ivan Day (Shire Library)
A slim but special volume which tells the story of ice cream in Britain - from fine cuisine, to entrepreneurship, to food for fun. Made especially interesting due to its author - food historian and advisor to all modern-day chef ingénues: Ivan Day. It also benefits from wonderful illustrations taken from Ivan's extraordinary collection of antiquarian books on the subject, and historical memorabilia.

River Café Pocket Books: Puddings, Cakes & Ice Cream
Rose Grey & Ruth Rogers
A couple of recipes which are 'keepers' in here that make this a very worthwhile book. Their methods are sometimes quite unusual and result in intense full flavour which I like. Try the Strawberry & Amalfi Lemon Sorbet which uses whole lemons!
Excellent for a more grown-up pudding.

Ices
Liddell & Weir
A collection of over 200 recipes from the familiar to the exotic including sorbets, gelatos, parfaits, spoons and ice-creams. Classic French, Italian and American ices are represented as well as those from Asia and the Middle East. All are suitable for making with or without an ice-cream making machine.