Module Twelve: Frying

Introduction

When food is fried it develops a crisp light brown coating and a distinct flavour. Perfectly golden, delightfully crisp, deep fried food is a favourite.

Frying originated in Egypt around 2500BC and because of its popularity has been developed over the ages. Developed equipment now caters for many methods of frying.

We can categorise the various frying methods into 2 categories:

- Shallow frying. It includes 4 different techniques: shallow frying, sauté, sweating and stir fry.
- Deep frying. Where food is cooked fully immersed in hot oil or fat. This method includes Triple Cook Frying for chips.

Another characteristic of frying is that it is a quick method of cooking which makes it ideal for Fast Food outlets and Catering where quick cooking times are required.

Definition

Frying is defined as cooking food in oil, fat or butter using convection for heat transfer.

Oils and fats are chemically the same but have different melting and smoking points and fat is solid at room temperature. Commercially, you may see palm and coconut oils described as fat because they are solid at room temperature.

Over the ages many oils have been produced from many sources like olive oil, vegetable oils, canola or rapeseed oil, grapeseed oil, coconut oil, palm oil, nut oils like peanut oil or sesame oil etc. Oils can also be infused to produce chilli oil, walnut oil, truffle oil and as many more as chefs' imaginations have broken barriers to achieve their desired flavouring. In Appendix A we will look at different oils and their attributes.

Butter is made by churning fresh or fermented cream or milk which separates the fat (butter) from the liquid (whey) in the cream or milk.

For simplicity I will use the term 'oil' for all and point out differences in techniques where they arise.

Frying is a challenging technique. The critical aspect for all frying is temperature control of the oil and timing.

Most commercial deep fryers have in built temperature controllers but, for home deep frying using temporary fryers, you can use equipment like an instant temperature reader (e.g.Thermapen). The Institute strongly recommends you monitor and control temperature for all frying, including shallow frying.

For shallow frying good temperature control means the oil must not be allowed to burn but, hot enough to seal the food and coating to trap in the juices. Hence, high smoke point oils are preferred.

Some recipes require their own temperatures but normally, for deep frying, you should preheat and maintain your oil to somewhere between 160° and 190°. Keeping your oil hot enough—but not too hot—will ensure crispy, golden and never soggy results.

As with all things Cookery, you need your Cookery Awareness whenever you fry. For example, be aware that the temperature will drop when you introduce food items and using your visual as well as hearing senses are critical for frying.

Applying your Cookery Awareness, all fried food will have oil residue so, important to drain before serving and importantly, to make sure no sogginess, best to drain on a rack over absorbent paper.

A. Shallow Frying

Shallow Frying is where food is cooked in a shallow pan with a little oil. Shallow frying best practice rules are:

- Because of the simplicity and speed of the cooking process the food items must be of good quality.
- Use the right pan for the job – the principle we established in Module 2 in particilarly important for frying. A pan with a thick base for even heat conduction is preferred to avoid hot spots. More on hot spots below. Some chefs even use pots for frying because of their thick base. The size of the pan is also very important for frying. Select a pan and heat source for even conduction of heat.
- It is also important that the food item is flat. Prepare food so that it does not curl up, e.g. by scoring the fat side for a pork chop.
- Food must be cut into even single portions or small pieces for quick cooking. Use a clock face as a guide for placing food items in the pan so that you can keep track of which ones to turn.

- The side of the food that will be presented up on the plate, the presentation side must be cooked first.

- Do not add food to a cold pan with cold oil. If cold, the food will soak up the oil and stick as the heat rises or even start steaming and turn soggy. To heat the oil, you can heat the pan first. So how do you know when the oil is ready to introduce the food? Add a drop of water and if it evaporates it is ready for the oil. Add the oil and swirl to coat. The hot pan will heat it up in seconds. One useful exception to keep in mind is for garlic or anything that develops a bitter or rancid taste when dried out of moisture. The garlic or even spices will flavour the oil as it heats up. Other exceptions are food items with fat like bacon or duck with skin on. They will release their fat as the heat level rises and do not need any oil. You can start them in a cold pan without any oil. But, also see Appendix III for pork chops!

- Whether you are frying beef, chicken, fish or pork or even vegetables in a stir fry, never introduce straight from the fridge to the pan. Let the food sit in room temperature for 15 – 20 minutes. This will ensure even cooking throughout and avoid raw centres or sticking.
- Shallow frying requires a good sear. We have already reviewed the benefits of sealing in Modules 8 & 9.
- Season just before adding the food to the pan. But keep in mind the moisture extracting effect of salt if added too early or, pepper becoming bitter when scorched. On time seasoning and throughout the cooking process brings out the natural flavours of all ingredients. In Module 3 we saw how seasoning rounds flavours out, brings them together and transforms the dish from bland to flavourful.

- Do not overcrowd the pan. Overcrowding reduces the pan oil temperature and introduces too much moisture from the crowded food item. This will induce steaming and turn the food soggy. Use the right size pan for the food: make sure none of the pieces are touching; there should be space between the pieces. Consider using a larger pan, two small pans or, if necessary, work in batches.
- Mince deserves a special mention: We want it to be juicy and tender. If you overcrowd, the mince will stew, lose moisture and may end up with stuck lumps. Our research shows the best way is to add 2/3 teaspoon of Baking Soda per kilo of mince and let it sit for 15 mins. Use a little oil on medium high heat, add the mince, separate and cook. The Baking Soda raises the pH of the meat inhibiting protein bonding for juicier and more tender mince.

- Some food items are coated with batters or crumbs to protect the food surface from the high temperatures of the oil or butter. We will explore wet and dry coating further in this Module.
- As always, the Institute's rule is to taste, adjust seasoning, taste again and so on until seasoned as you require before removing from the pan.
- Use a rack over absorbent paper to remove excess oil before serving.

Shallow frying techniques

1. **Standard shallow frying.** The pan and the food is only turned once. Hence, it is important to have enough oil to come up to half the food items height. This ensures thorough cooking of all sides when turned over. A medium to high temperature is required for most food. For a video presentation of all you need to know about Shallow Frying click here.

2. **Sauté** (to jump). The food is tossed in a minimum amount of hot oil or butter to evenly colour and cook the food. This is suitable for vegetables or sealing small pieces of meat. For a video presentation on Sauté click here.

3. **Sweat**, to cook without altering colour at a low temperature with a small amount of oil or butter. This is usually done to cook onions where they are required to be soft but not brown or crisp. It is important to toss the food frequently to avoid any sticking. For a video presentation of Sweating click here. Sweating is not the same as caramelising. Because Caramelised onions are important as a base for many dishes, Appendix II sets out The Institute's Onion Caramelisation process.

4. **Stir fry.** A small amount of very hot oil in a wok, continuously stirred or tossed to cook the food quickly. Commonly used in Asian style of cooking. This is a fast and healthier way of frying.

Importance of avoiding Hot Spots

We came across Hot Spots in Module 2. For even cooking, hot spots are to be avoided at all costs. Because of their negative effect the Institute has undertaken research on why they occur.

Our research experiments were conducted in a controlled environment using oil and a solid stainless steel pan which is normally a good and even conductor. The heat source position was used to create hot spots on the pan.

The experiment

As the temperature rises above 350 degrees, the oil moved to form thick ridges and thin troughs. We came across this in Module 2, as "oil rippling." As the temperature increases further, thin areas spread out and the ridges became fewer and higher. You may also observe this effect as the alcohol lines that run down the inside of a glass of wine or spirits. This is referred to as the Marangoni convection in a wine glass.

What happens is that with uneven temperatures and uneven heat conduction on the oil's surface, it causes the oil to retreat from the hotter spots and get pulled towards the cooler areas.

This uneven heat conduction will cause uneven cooking and the dreaded sticking of food items to the pan where the oil has retreated from.

To avoid sticking, use sufficient oil – this does not mean excessive oil - half a teaspoon is sufficient for an egg or piece of fish and one and half teaspoons for small piece vegetables such as for a mirepoix cut. After heating the oil, tilt the pan to evenly spread the oil, reduce the heat and introduce the food item. Some food items will also be coated with oil or an oil-based marinade.

Non-stick pans are of course designed to avoid this, but off-centre heat sources can still produce uneven cooking. So, why not be aware of this to be able to take advantage of metal pans without the non-stick chemicals. Also, non-stick pans will induce steaming which is not desired for frying. As we saw in Module 2, for even heat conduction use heavy base pans and Stainless Steel pans are ideal for frying.

Finally, be aware that excessive cleaning or scouring as well as the location of the heat source can also cause uneven cooking and consequent sticking of the food item to the pan.

There is one dish that you need to perfect to demonstrate good shallow frying technique. Some prospective Chef employers also use it to assess prospective employees. So, make sure you perfect how to make a perfectly cooked **fillet of fish with crispy skin** as set out below.

So, how do you avoid a soggy skin or one that comes off the flesh surface? You just need to apply what we have learnt from prior Modules and apply your Cookery Awareness: undestand the product and what is happening to it.

The key process to avoid is steaming. It will naturally occur due to the moisture in the fish flesh and skin. For a crispy skin you need to avoid the steaming process and allow the browning/searing process to take over. Follow these steps:

1. Right tool for the right job principle from Module 2 applies. Avoid non-stick pans as they will allow steaming to dominate. Avoid cast iron pans because they are porous and will retain the flavour elements from their last use or prior seasonings. Use stainless steel pans. Size? Large enough to allow the steam to flow away.
2. Think about the product. From our Module 3 you would be aware of the high moisture content which will make the fish flesh and skin stick to the pan. Dry off moisture as much as possible. Pat dry, let sit on wire rack at room temperature or keep in the fridge for a while. However, as for all cooking, allow the fish fillet to come to room temp before cooking. Recall that another way to extract moisture is to rub the skin and fillet surface with salt. But be aware of the salty flavour you introduce. So, it depends on what finished product you want to end up with.

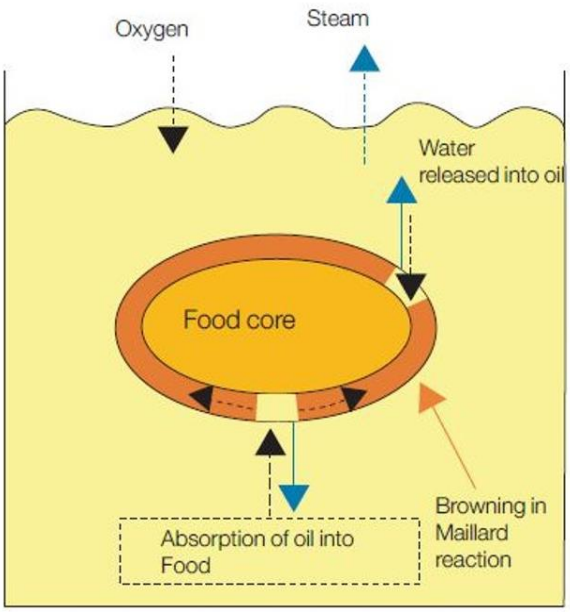
3. Apply the correct cooking process for sealing. Crank up the heat and when the oil just starts to smoke lay the fish fillet skin down in the centre of the pan – listen and look for the hiss and crackle – become aware of what is happening. The fish fillet will now start to curl up. Use a fish spatula to flatten for about 30 seconds.
4. If the fillet looks like it is sticking, be patient and the fish fillet will eventually start to release itself from the pan! In about 3-4 minutes depending on thickness of the fish fillet, the flesh will start to turn opaque half way up. Check to see if the fillet can easily be lifted from the pan with no pressure. If not, abort. Be patient and allow more seconds. Your developing Cookery Awareness should get you to realise that as the moisture evaporates the skin dries out and allows the oil to start frying the proteins and sugars in the skin to brown and crisp. When you can release the fillet easily, you are ready to flip.
5. Flip the fish fillet onto flesh side and keep cooking for 1 – 4 minutes depending on thickness of the fillet. Again, listen, look and feel the moisture evaporating and the flesh cooking. Nudge it to see if easily moved. If not, just hold for a few more seconds and try again.
6. As for all cooking methods for fish do not allow the internal temperature to exceed 80 °C. You can use a temperature probe.
7. When free, transfer to a wire rack for the crucial resting period for the juices to repopulate the sealed flesh for a tender and juicy fillet.

B. Deep frying

Deep frying is where food is fully immersed in hot oil to produce crispy golden exteriors and grease free on the inside for one of the best texture experiences. Because of the process there a lot of variables to consider. We have done a lot of research at the Institute to come up with the following tips for great Deep Frying:

- **Even and Correct cuts.** Food items should be cut into small, even and thin single portions to cook quickly.
- **Preheat the oil** to the required temperature, the oil must be hot enough to seal the outer surface of the food quickly and cause it to cook internally. Commercial and most home deep fryers have inbuilt temperature controllers. If you don't have a thermometer you can test 170 ° using a cube of bread to turn golden brown in 20 seconds.
- **Control temperature at all times.** Normal range for good frying is 160°c to 185°c. This is the most crucial factor for great deep frying. Apply your Cookery Awareness when introducing any food item and consider how the oil temperature will react. Frozen items require longer cooking.
- There must be **sufficient oil,** a ratio of 1 for food to 6 for oil for non frozen food and 1 to 10 for frozen food items. Top up the oil as required.
- Good **deep frying is fast and even** – forget any slow submerge technique.
- Deep fried food must be **drained well on absorbent paper** to remove excess oil after cooking. This is the best way to drain excess oil.
- **Use Appropriate Coatings.** All food items except fries, should be coated using wet or dry coatings. Right coating is crucial as excess coating may create sogginess and minimum coating promotes crispiness. More on the science and art of coatings later.
- **Season after frying.** The batter may contain sufficient seasoning but if you need to add seasoning, always season after frying, not before. Even salt will affect the oil and may darken it.
- **Avoid the dreaded greasy flavour or soggy texture.** Failsafe rules are: firstly, check your oil temperature, if the oil is not hot enough the food will absorb oil; secondly, make sure the food is well drained of water and moisture; thirdly avoid overcoating: excess batter may produce a soggy product.

- **Apply your Cookery Awareness** to what is happening to the food item and the oil. There are 3 stages in the Frying Process.
    - Initial heat from the preheated oil. The food item's surface heats to boiling point and moisture turns to steam and starts to evaporate into the oil and out of the vat.
    - Crust formation from the Browning and Maillard action depending on the coating. This is normally in the first 60 seconds of the frying process sealing the food.
    - Cooking the interior: With continued heat transfer from the oil, the moisture in the core of the food item turns to steam and makes its way to the surface. You can see this as bubbles forming on the surface. As soon as you can see the surface bubbles, remove the item as residual heat will continue to cook the interior. Some moisture as steam is released into the oil to escape from the fryer.



- **Avoid overcrowding the fryer.** Think about the food item rising. You need to leave room for each food item to rise. Overcrowding will also increase cooking time with its negative effects.
- **Avoid frozen or chilled items.** They will reduce the temperature so try and bring to room temperature.
- **Use a Slotted Spoon or Spider** to remove items from the oil. Do not use tongs as they can pierce the crispy batter.

- **Avoid oil splatters.** Oil and water don't mix. Be aware of the water content of all food, even in fries. It is crucial to drain fries or other food of all moisture and never use use wet spoons or baskets in the fryer.

Now that we have covered best practice for great Deep Frying, let's look at how you can maintain the oil for failsafe Deep Frying.

How to Look After your Oil for Deep Frying

The oil used for deep frying is expensive and must be maintained correctly to get maximum usage from the oil. Oil begins to breakdown when it's old, overused or heated too quickly. For best results, ensure your oil is replenished daily, skimmed regularly and replaced every four-to-five days. Avoid oil degradation from the following factors:

- **Minimise moisture introduction** from any source. As well as the sources noted above, be aware that any coating will have moisture that will evaporate through the oil.
- **Equipment Choice.** Moisture can also come from condensation dripping back from the fryer's exhaust. Avoid contact with copper or brass utensils.
- **Salt.** Do not add salt to food prior to frying and never over the deep fryer as salt will boost moisture extraction and chemically react adversly with the oil.
- **Food particles.** Remove food particles using a fine sieve or strain the oil through the fryer filter. Drain properly and thoroughly after each session use.
- **Detergent.** Wash the fryer with detergent but remove the residue completely before use.
- **Sunlight.** Cover the oil when not being used.
- **Oxidisation** from oxygen in the air.
- **Overloading or overcrowding the fryer.**

- **Prevent the oil from darkening.** Keep the oil well strained and well skimmed when using. The oil will darken if:
  - you leave crumbs from the batter in the oil;
  - prior seasoning with salt;
  - any food with a naturally high sugar content can also cause oil to darken. This can occur with end of season potatoes, in particular.
- **Avoid smoking oil.** If the oil starts to smoke, you may need to turn the heat down. After smoking, the oil needs to be replaced. Once heated past its smoke point, the oil starts to break down, releasing free radicals and acrolein, the chemical the gives food that sharp, bitter "burnt" flavour and smell.

- **Avoid oil foaming**. Foaming can occur from:
    - Excess starch leeched into the oil from chips and batter. A simple solution is to wash and soak chips for at least an hour before frying and ensure the chips are dried thoroughly before you drop them into the oil.
    - Overloading the fryer can also cause foaming explosions. Maintain an oil to food ratio of about 6:1 and keep vats well skimmed and strained of any batter debris. Oil should be topped up each day and completely replaced every four to five days.

Indicative Times and Temperatures for Deep Frying

As timing as well as temperatures are critical to good Deep Frying, use the following indicative times and temperatures:

Food	Temperature (°C)	Time (minutes)
Chicken Pieces	170	6 – 8
Chips (frozen)	180	4 – 5
Croquettes	185	2 – 3
Donuts	185	1 – 2
Fish (fresh)	180	2 – 4
Fish (frozen)	180	5 – 6
Onion Rings	180	2 – 4
Schnitzel	180	3 – 5

Deep frying equipment

Bench top Fryers

These are small portable electric units that hold a small amount of oil and can cook smaller amounts of food than the larger free standing units. They are controlled by a thermostat for safe operation and accurate temperature control. These smaller units are simpler to clean and maintain than the larger free standing units.

Freestanding Fryers

These are the units that are normally used in commercial kitchens and restaurants. They may be gas or electric powered with 1 or 2 oil wells. They are always controlled by a thermostat, often computerised for accurate temperature control. They have a large capacity of oil of up to 40 litres for cooking larger volumes of food. They come with a tap for draining and usually with an oil filter.

Temporary fryers

This may be a large pot or wok on a stove top. This is suitable for cooking small amounts of food in a domestic situation. Safety precautions must be considered when using this temporary set up.

To control the temperature you can use equipment like an instant temperature reader (e.g.Thermapen). To get good results you must be aware of the following:

- Effect on the temperature of the heat source. Whether electric or gas, it must be strong enough to maintain temperature level or regain it after it drops;
- The temperature will drop after you introduce a food item. The size and temperature of the food item will affect the temperature change. This is why it is recommended that the food items for frying are at room temperature;
- The heat retention and ability to regain heat of the pot/pan/wok etc. used as the temporary fryer. As we have discussed in Module 2, different metals and different thicknesses in the base and sides affect heat retention and conductivity. Generally, the thicker the better.

Safety

It is crucially important to be aware of the deep fryer, the frying process and to take care when handling frying oil. Hot oil splashes can cause serious burns and you have to be aware of the effect of any water coming into contact with hot oil, including moisture in any food item.

Coatings used for Frying

Various coatings for frying food have been developed over the ages and in various cuisines. Their rationale is:

- to retain the moisture whilst protecting the food and keeping the oil out;
- to add texture which, as we have already seen is a crucial element of any recipe profile. They can also add or boost flavour with seasoning or added herbs or spices in the flour, egg, crumb or oil.

Coated food is usually fried but can also be grilled and even baked. There are two categories of coatings: Dry and Wet.

Dry Coatings

Bread crumbs, fresh, dried or even something simple like corn flour are widely used in Asian cooking. There are also specially developed crumbs like the Japanese Panko. Use white crumbs to be able to see them better turning golden brown v. brown crumbs.

Coating technique has 5 steps.

1. Season flour
2. Dip the food into the seasoned flour
3. Dust off excess
4. Dip into egg wash (egg and milk)
5. Dip into bread crumbs.

Wet Coatings

Batters have been developed over the ages in various cuisines. The word is derived for the French word "battre" which means to beat as many batters are whisked.

A batter is a liquid mixture of various viscosity from "heavy" (sticking to back of spoon) to "thin" with a viscosity like cream sometimes called "drop batter".

They are usually made of grains mixed with liquids like water, milk and eggs. Leavening agents (we looked at in Module 9) like baking powder, natural fermentation, carbonated water and beer are used to aerate or fluff up the batter as it cooks. Batters may be flavoured by herbs, spices and with even fruit and vegetables. The application of heat from hot oil sets batters.

As you develop your expertise you can experiment and develop batters that suit your taste. There are three standard batters which you must master for this course and they are tested in the assignment.

Tempura batter, is a Japanese light batter used on vegetables, seafood and chicken. Its lightness derives from using gluten reduced flours like rice flour or cake flour and even a mix of potato starch and cornflour. Cold water as against warm water also stops gluten development (refer Module 10) which could make the batter sticky, heavy or doughy.

Beer batter

Beer is used in batter to add body and lightness from the bubbles. The beer should be cold. The alcohol evaporates quickly to keep batter dry in the oil and foaming agents and CO_2 create bubbles for a light crispy texture. Different types of beers also add colour and flavour. It is suitable for seafood, fish and onion rings. Vinegar and sugar are sometimed added to beer batter to help the food item crisp up more.

Yeast batter, used on fruit and fish. Yeast batter works best on fruit as the yeasty flavour accentuates the fruit flavours and rises into a puffy type batter. Using yeast as an ingredient necessitates using warm water to make the yeast come alive and react but not hot water which could kill it.

Other batters to consider:

Corn Flour batter (250g corn flour. 1 cup cold water, 2 egg whites lightly whisked) is transparent and very good for zucchini or pumpkin flowers. **Egg White batter** (250g plain flour, 1 tsp salt, 6 tbsp olive oil, 1.5 cups warm water, 2 egg whites stiffly beaten) good for fritters.

Preparation for Frying

As this is a fast cooking method it is critical that all mise en place must be completed before the cooking can start.

Wet Coating Process

For wet coatings the following steps are critical:

- Make sure the batter consistency is just right:

- Trim and cut the food item to even portion or medallion size.
- Have the necessary equipment for adding and removing the food from the hot oil at hand.
- Make sure the oil temperature is right by testing it. Drop a little of the batter into the oil and it should return to the surface and turn golden.
- Have a proper tray or absorbent paper for draining the fried food in place.

Wet Coating Batters. We will now look at recipes for basic batters which you must be aware of and be able to make successfully.

Name: **Beer batter.** There are a lot of variations but this one is for a perfectly crisp batter – not chewy (no egg) and to hear and feel the crunch. Use to coat until dripping, not too light or too thick.	Suitable for onion rings, fish fillets.
Ingredients	**Ingredients**
Beer 1 ¼ Cup – cold – your favourite, but lighter the better. 1gm Salt; Splash of vinegar	1 tsp Baking Powder 1 x Cup Self raising flour Plain flour for dusting

Method:

1. Blend the dry ingredients in a bowl, add the wet ingredients and mix to a smooth batter. Rest for 20 minutes but keep cold.
2. Dust the food with seasoned plain flour before coating with the batter – use your favourite seasoning.
3. Deep fry immediately in tested hot oil until light brown and crispy. The cold beer's alcohol (evaporates quickly to keep dry), foaming agents and CO_2 help create the bubbles for added crispiness.
4. Drain well on rack over absorbent paper and serve quickly.

Name: **Yeast Batter**	Suitable for fruit (bananas, apple slices, strawberries)
Ingredients	**Ingredients**
100gm plain flour 2 eggs 10gm yeast (fresh comprest)	100gm corn flour 250ml warm water (37°c., not hot) to get yeast to react but not kill it. 20ml oil

Method:

1. Blend the yeast with the water.
2. Beat the egg and oil in a bowl, add the yeast water.
3. Sieve the flour into a large bowl and add the water mixture and mix to a smooth batter.
4. Cover the bowl and keep it warm at approx. 37°C for the batter to prove, it should double in size in 30 to 40 minutes.
5. Dust the food items in plain flour before coating with the batter, deep fry immediately in tested hot oil @ 175°C until light brown and crispy.
6. Drain well on rack over absorbent paper. For fruit, dip in cinnamon sugar.
7. Serve quickly as the batter will soften and loose its crispy crust.

Name: **Tempura Batter**	Suitable for vegetables and all types of seafood
Ingredients	**Ingredients**
1 cup rice flour, sifted. It has less gluten than wheat flour. 160ml cold water or cold soda water	10gm baking powder Salt & pepper

Method:

1. Mix the baking powder into the rice flour then add the cold water slowly to form a batter. Season. Store in cool room if not used immediately. The water must be cold to avoid developing gluten which will make the batter sticky or doughy.
2. Just before cooking, use chop sticks to mix. Do not over mix. Keep the liquid ice cold, this is required to reduce gluten development in the batter.
3. Lightly dust the vegetables with flour.
4. Coat by dipping into the batter.
5. Fry in tested hot oil and serve immediately.

Name: **Institute's Retro Batter** for seafood. After some research, this is our favourite for the ultimate crisp and crunch.	Suitable for retro fish medallions of meaty firm fish like Ling or Stargazer (monkfish in northern hemisphere).
Ingredients	**Ingredients**
200gm semolina flour + a little for dusting 100gm Tapioca starch 1 tsp Baking Powder	330ml Sparkling Water – we like Evian from glass bottle Your favourite seasoning: Paprika? Chilli? Cayenne?

Method:

2. Mix the flours and Baking powder in a bowl.
3. Season with your favourite seasoning.
4. Pour in the sparkling water and whisk to form a loose batter.
5. Use some of the Semolina flour to dust the fish medallions, dip in the batter, shake and fry in tested oil.

Serve immediately with a zingy mayo like lemon mayo and garnish with lemon zest.

Dry Coating Process

As for Wet Coating, Mise en Place is essential. As well as prepping the hero item, the coating ingredients must be in place and ready for use. The coating process involves 3 steps:

Step1.Dip into flour for a thorough coating and shake off any excess flour.

Step2. Dip into an egg wash making sure the whole item is coated, shake off any excess.

Step 3. Dip into a prepared crumb for a thorough coating. Press to stick for maximum coating.

The food item will then be ready for frying but, for even more crispy, crunchy exterior you can repeat the coating process for 2 coats.

The objective is to get the crispiest, crunchiest, lightest exterior and golden brown colour with great flavour.

As moisture is the enemy of crispiness/crunch and will end up in a soggy crust we have to first extract moisture off the hero but not so much as to turn it dry and stringy! To achieve this, use the following Tips. We can use a Chicken Schnitzel dish as an example but this applies to all meat or poultry.

Tip 1. Prepare the chicken fillet. Trim any fat or sine and make sure the chicken fillet is flat with even thickness. Look for any thicker parts, place between 2 sides of cling film or baking paper and pound from the centre out – firmly but, not too emotionally crazy! Make sure any thicker parts are flattened to same thickness as rest. For a thicker piece of around 2.5cms, score across both sides before pounding to avoid pounding for a few minutes! Remember, even thickness means even cooking: aim for around 1.5 cm thickness. For chicken breast, make sure you remove the little tenderloin we came across in Module 3 at the back of the breast – this will turn into mush with pounding. Even better, keep to coat and fry separately as a delicious snack!

Tip 2. Prep with your favourite seasoning and allow it to marinade for at least half an hour in the fridge. This will also aid in moisture extraction.

Tip 3. Prepare the coating ingredients as a train process:

Flour. All purpose flour needs a little cornstarch for extra crunch. For extra flavour why not season the flour with your favourite seasoning as well. You can use your favourite chilli, smoked paprika, herbs, garlic powder, spices… the list is endless and depends on what seasoning, herbs and spices you love. Season generously to distribute throughout the flour. Some Chef's will taste the flour to check the seasoning!

Egg wash. The egg dip has to be cold, thin and not gluggy with egg bits. It has to coat, not cover with solids. Again apply your favourite seasoning instead of just adding water…beer, vinegar or a chilli sauce are great.

Crumb. This could be homemade bread crumbs from processed stale bread or use a specialised crumb product like Japanese Panko. Why stop with the seasoning? Add your favourite to the crumb and your favourite can be anything that you can crush or grind to the size of the crumb. Important to have consistent size for consistent frying. Consider nuts or spices ground with a spice grinder.

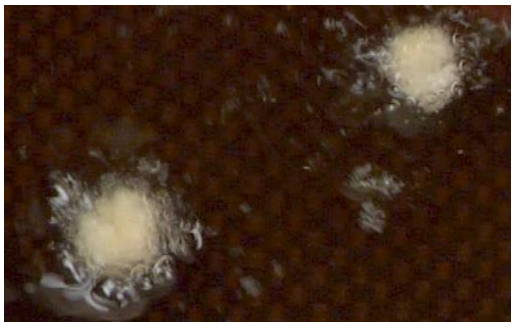
Prepare the Oil. Whether you are deep-frying or pan-frying, flavour the oil as well! Add chilli, a bunch of herbs or garlic cloves to the oil before heating it up. They will flavour the oil as it warms up but get them out before they brown or they can add a bitter or burnt flavour to the oil.

Tip 4. Prepare for frying.

Mise en place Is essential. Make sure the chicken, coating train ingredients together with all necessary equipment for immersing, removing and for draining of oil after cooking, are in place.

If deep frying, get your oil ready at the required temperature for deep frying which, as we saw above is 160°C to 185°C. Make sure you have sufficient oil : as above, a ratio of 1kg food to 6kg oil for non frozen food and 1 to 10 for frozen food items. Top up the oil as required.

As for all deep frying, you have to test the oil. Sprinkle a few of the crumbs and look for bubbling around the crumb. Adjust until you get the bubbling.



Remember, moisture is the enemy of frying so for maximum crunch and crispness, apply the following rules:

- Shake off as much flour as you can
- Shake off as much egg as you can for a thin coating
- Immerse in crumbs and squash down using baking paper and your palm for maximum compressed cover…….For extra crisp exterior, repeat the egg dip and crumb cover.

Tip 6. Test a batch.

You have tested the oil but it is also advisable to test your first Schnitzel:

- Fry until golden brown. Place on paper towel to drain excess oil.
- As with all things at the Cookery Institute, taste, adjust for seasoning including the seasoning of all the coating ingredients, test and taste again if necessary.
- If you need to add any seasoning to the fried item for a final flavour boost make sure you add whilst hot and quickly (within 30 seconds). The residual heat will melt the added seasoning, pulling it into the chicken. If you wait longer you will just end up with cold seasoning sitting on top of your coating.

Throughout, apply your Cookery Awareness from what you have learnt in this Module. See, hear and think of what is happening to the moisture in the chicken item and the coating.

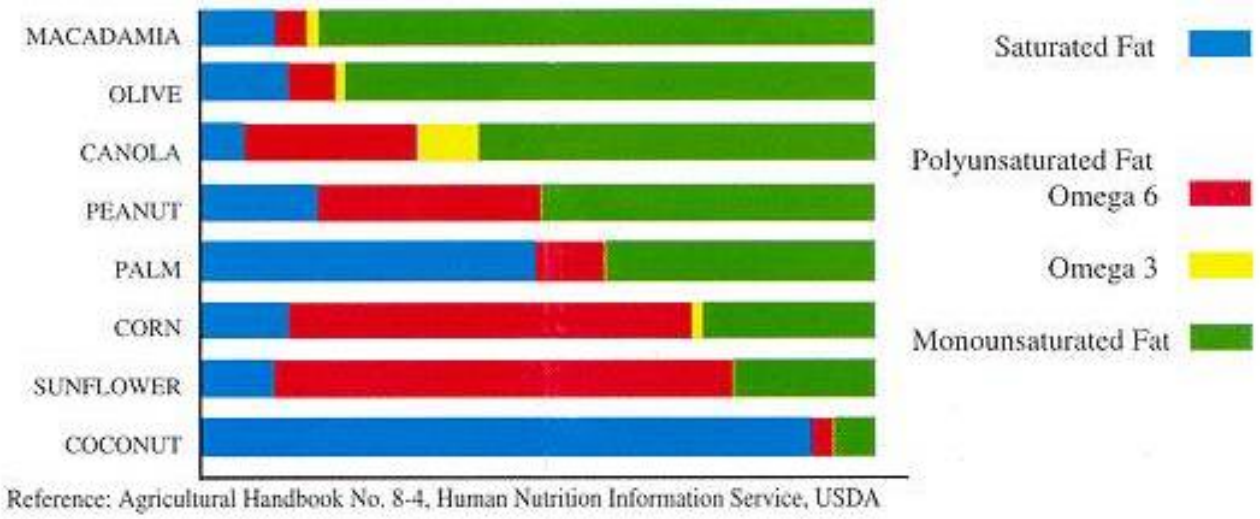
When just right, repeat for the required portions and serve hot with your dish accompaniments and garnish. Important to serve it quickly.

Appendices to Module 11

Appendix I: Oils

With such a huge variety of oils it is important to know what oils are suitable for different frying applications.

Firstly, it's worth looking at the different fats that common cooking oils are made of. This is important to keep in mind for long term health implications of your planned dishes.



Over the long term we are medically advised to minimise saturated fat and use more of the other fats and polyphenols.

Olive oil

Olive oil is the true kitchen all-rounder for cooking as well as for dressings and finishing dishes. It is made from the fruit of the olive tree.

What to look for:

- "Cold pressed" process. Cold pressing does not apply heat during the crushing and pressing to extract the oil. This avoids changes in the olive's chemistry and minimises defects. The resulting oil has a natural low level acidity.
- Intensity of flavour for planned dish. Depending on the extraction process olive oils come in very different flavour intensities.
- Smoking Point. Depending on the extraction process, olive oils also have different smoking points and therefore suitable for different cooking processes.

Here are common olive oil products:

- Extra virgin olive oil. Extracted from the first press and always cold-pressed. It has only 1% acid and is considered the finest and fruitiest. This also makes it the most expensive to buy, but its flavour can't be substituted for anything else. Suitable for dressings and drizzling over dishes to add flavour, body and gloss (finishing dishes).
- Virgin olive oil. This is also a first-press olive oil, however, it has between 1 and 3 percent acidity. If you're unable to find extra virgin olive oil this is the next best option for dressings and finishimg dishes.
- Pure olive oil. Heavily processed oils that have had most of their distinct flavours and aromas removed in the extraction process. While it is still a source of monounsaturated fat, it no longer contains the polyphenols that make olive oil so good for you.
- Fino olive oil. Meaning fine in Italian, this oil is a blend of extra virgin and virgin olive oils.
- Light olive oil. A highly processed, light coloured oil with very little flavour. Because of the minimal flavour, it is used in mayonnaises and baking where you don't want a strong olive oil flavour to dominate.

In descending order, Virgin Olive oil is suitable for dressing and finishing dishes where an olive oil flavour is required to Light where with a higher smoking point used for cooking and where no olive oil flavour is required.

Canola oil

Made from canola seeds, a genetic variation of rapeseed. By definition, if a seed is labeled "canola" it has to have less than 30 micromoles of glucosinolates and less than 2% of erucic acid of Rapeseed oil. It was developed in Canada in the 70's, hence Canola.

It is beconing a favourite due to its health benefits : fatty acid profile, omega-3 and low saturated fat contents. Canola oil is also very versatile as it has a neutral taste, light texture and medium smoking point.

Best for: light cooking, frying sauces, muffins, mayonnaise and light cakes.

Sunflower oil

Made from sunflower seeds. Sunflower oil is low in saturated fat and high in Vitamin E, and favoured for many health brands.

Best for: frying, salad dressings and as a substitute for canola oil.

Vegetable oil

This inexpensive oil is often a blend of several different oils such as soybean, palm and sunflower in varying proportions. Widely used for deep frying, this oil is high in saturated fats and has very few health benefits.

Best for: deep-frying and general cooking.

Nut oils (walnut, almond and macadamia)

Made from nuts these delicately flavoured oils are ideal for adding to a dish or dressing for their signature nutty flavours. They are very delicate and should be stored in a cool, dark place as light and heat can quickly turn them rancid. Unless you use them often, buy in small quantities to ensure they don't go off.

Best for: finishing dishes, drizzling over cooked vegetables and in dressings.

Peanut oil

The high monounsaturated content in this oil makes it a heart-friendly choice that is great for frying due to its high smoking point.

Best for: stir-frying, deep-frying and roasting.

Coconut oil

Made from the kernel or meat of coconuts and widely used in Pacific island cooking.

Best for: general cooking, baking and frying. It is particularly loved for making popcorn and chips.

Grapeseed oil

Made from the seeds of grapes used to make wine. Neutral in flavour and with claims of polyphenol benefits from its grape seeds source it is becoming a favourite.

Best for: mayonnaises, dressings, dips and sauces where a neutral flavour is required.

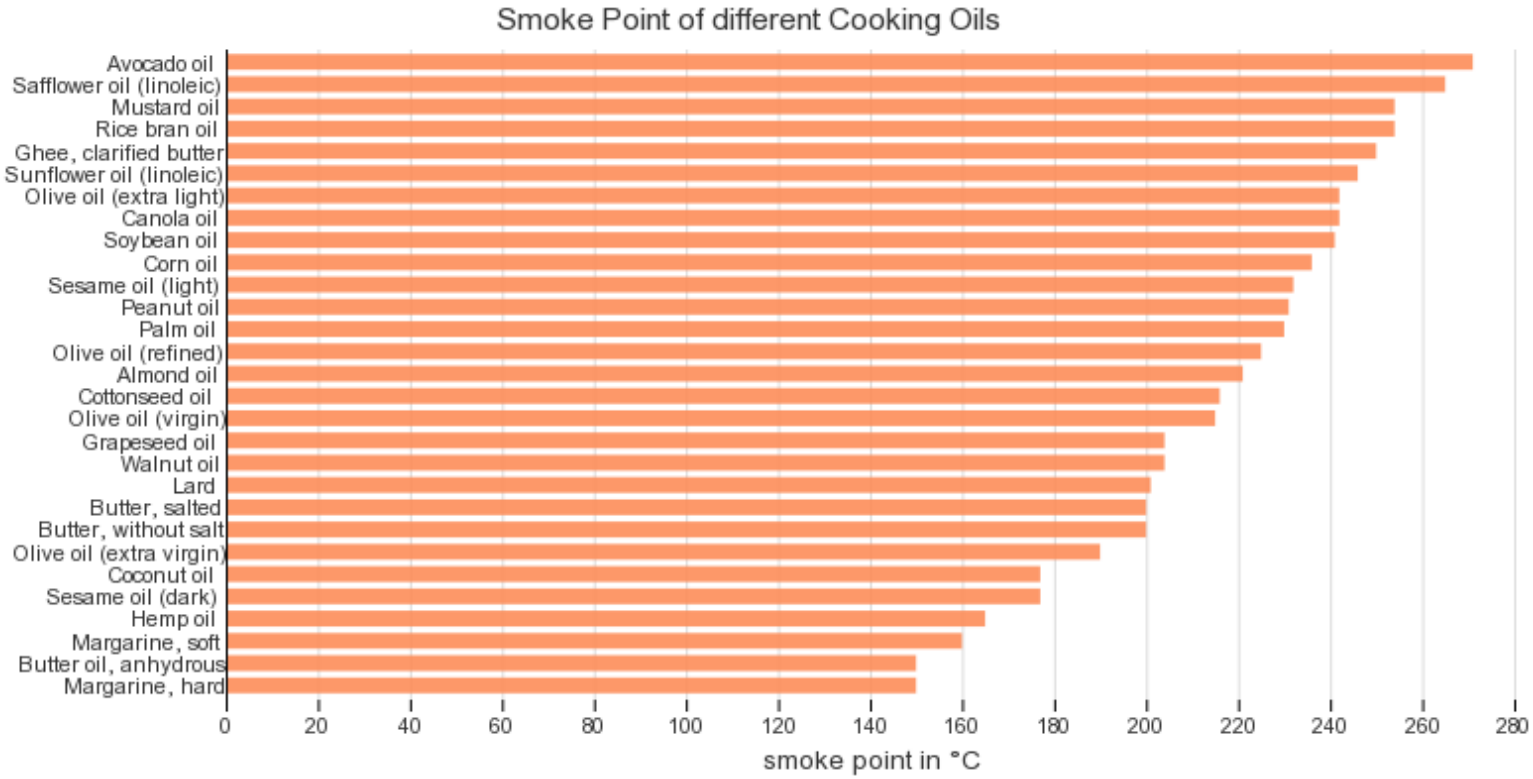
Sesame oil

Made from sesame seeds, it is high in antioxidants and should be used anywhere you want a slightly sweet, nutty flavour. Dark and flavourful, this pungent oil accentuates many Asian dishes and should only be used sparingly.

Best for: as a finishing oil in soups, dressings and stir-fries.

Oil Smoking Points

It is also worth noting the different smoke points of different oils to keep in mind when deciding which oil to use to achieve the required cooking of chosen ingredients. High heat cooking requires higher smoking points. Note how refined olive oil is better for high heat cooking than virgin olive oil which is better for dressings and finishing a dish. Also, you can now appreciate why Indian cuisine prefers to use Ghee with its high smoking point.



Appendix II: How to Caramelise Onions

Caramelising onions is a Shallow Frying process based on the Sweat technique, but with further cooking to release and transform the sugars in the onions. They can transform a dish and are the basis of many dishes including successful curries. Properly caramelised, they taste fantastically rich and sweet. They are not particularly difficult to make properly but, they need time and patience as well as a few tips developed here at the Cookery Institute.

Tip #1: Slice the onions evenly so that they look uniformly. Not too thick and not too thin.

Tip#2: For proper caramelisation set aside a lot of time. How long? It depends on the onions and degree of caramelisation you need for your dish. Some curries require 2-3 hours for the colour to turn to degree of brownness your dish requires. Normally 40-50 minutes will suffice. If you don't have the time to oversee the process you can use a slow cooker!

Tip#3: The correct process is to stir frequently so that they don't stick and don't burn. Professional curry makers follow the following process: stir until the oil or fat used to heat the onions splits (separates); add a little water and mix through so that they come together as a saucelike texture…..continue this process 4-5 times depending on the degree of caramelisation you need for your dish or colour.

Tip#4: Do not crank the heat up. Proper caramelisation requires slow cooking. High heat will burn the onions.

Tip#5: Why waste the flavour you have created at the bottom of the pan. Technically called "fond" the thin sticky film at the pan bottom contains fantastic flavour. You must deglaze. Choose wine, broth or even water depending on the dish the onions are being caramelised for.

As you can see from above, you have to bring your Cookery Awareness to bear and see (the browning level, the splitting or separating of the fat), smell (aroma change from caramelisation and avoid any burning), listen (to the initial light hiss as the onions hit the fat) and finally taste to make sure you have achieved the level of caramelisation needed for your dish.

Follow these tips for caramelising your onions – another hidden hero of many dishes.

Appendix III: The Cold Sear method for the perfect Pork Chop

You may well ask what is an Appendix on Cold Sear doing in this module of Frying when Frying has been defined as "cooking food in oil, fat or butter using convection for heat transfer". We have done some research for the perfect Pork Chop and even though you could pan fry it for a good Chop, the cold sear method delivers perfection every time.

It works for pork (and for that matter for veal or even chicken cuts) because unlike beef that needs to be sealed quickly, the pork proteins do not need to be sealed to retain juices. We have also come across how starting with a cold pan works for food items with fat like bacon or duck with skin on.

For the perfect pork chop choose bone in chop with an eye of loin, around 450grams and 1.5 inch (3.8cms thick). Here is a good pair:

Salt with 1.5 tsp salt overnight and bring to room temperature. You will need a big enough non-stick pan to hold both if cooking 2….apply your Cookery Awareness: do not overcrowd and allow some space for them to absorb the radiant heat.

Start a sauce of your choice, cook and keep warm.

Season chops with your favourite seasoning but, as we always say, avoid pepper which will turn bitter with the initial browning. Place the chops one skinny end facing one thick end, 1 inch apart in the cold non-stick pan.

Turn the heat on high, place pan on heat. The chops will now start to brown from the high heat radiating from the bottom. After 2 minutes, flip and brown other side on high.

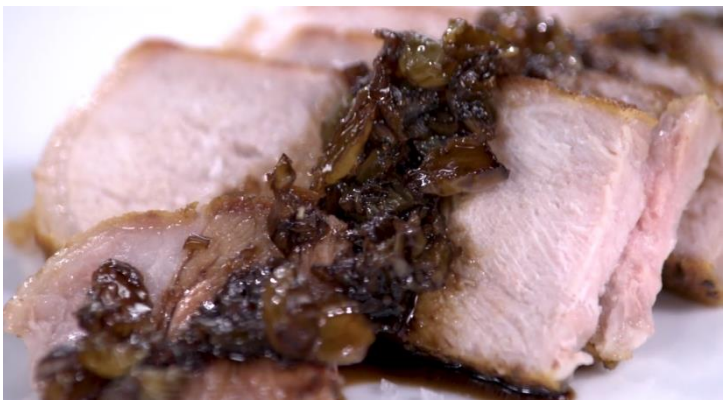
After 2 minutes, reduce heat to medium and keep flipping every 2 minutes until required doneness. Get your thermometer probe ready. These chops will take around 10 minutes to cook perfectly with an internal temperature of 60°C (recall we said 58.6° is safe for pork).

As always, rest for half cooking time.

Carve off the bone:

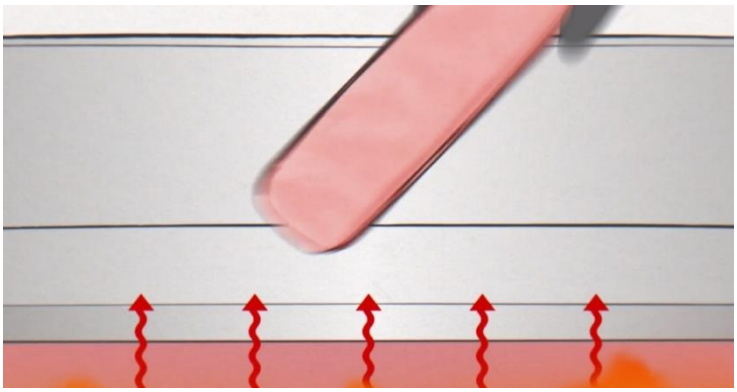
Admire the created juiciness:

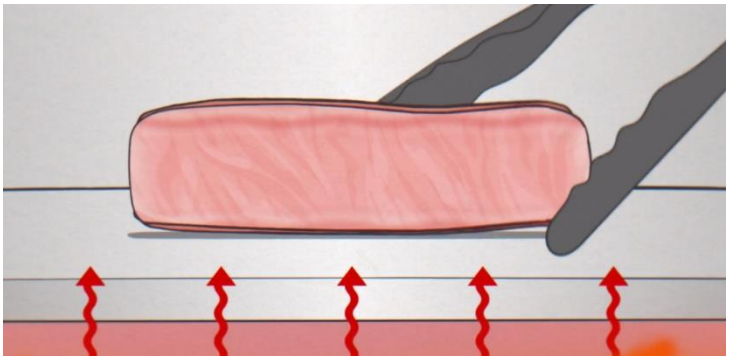
And serve with your favourite sauce:

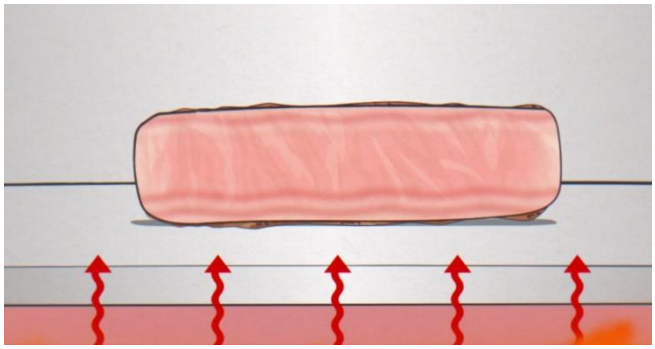


Now you may wonder that with the constant flipping and reduced heat it might take a long time to cook, but, frequent flipping does cook quickly but also evenly. Here is why:

As the heat source is singular and comes and rises from the bottom, with each flip, the heated side goes to the top and hot internal juices start to drop, whilst the prior cold top now is now heated from the bottom heat source. Eventually the heated cooked molecules meet in the centre and, importantly, the internal moisture or juices also spread throughout and evenly inside the cut. This is also why this constant flipping works for any steak using other cooking methods like grilling.







So the more often you flip the faster the heated internal juices transfer from top to bottom to meet in the middle for throughout even cooking.

Appendix IV: How to make an Omelette

Many Chefs will ask you to make an omelette to test your cooking technique ability. As with all things cookery, practice makes perfect but, there are some tips to apply for perfect omelette making.

Firstly, impress the Chef by asking whether he wants you to make a classic French one with creamy and soft inside and a pale yellow surface colour (on the right below) or a country style traditional one with soft curds inside and browned surface (on the left below).

They differ in the fork or spatula action whilst cooking.

Follow these Cookery Institute tips for successful omelettes:

Tip 1. One omelette will serve one person and, because it is so quick to make, it's not worth cooking a large one for two. So, use 2-3 large eggs per serve.

Tip 2. Ask him for his freshest eggs. The fresher the eggs the better, but up to two weeks old is fine.

Tip 3. Do not over-mix, do not beat or worst of all whisk. Solid lumps of egg or curds are desirable. Just crack the eggs carefully into a bowl, break up the yolk and blend with a large fork. Season with salt and freshly ground pepper. Use the fork to mix in a circular motion until blended with no egg whites showing.

For the classic French one herbs like parsley, chervil, tarragon and chives are added at this stage in the mixing.

Tip 4. Impress him more and ask for a proper omelette pan – a non stick pan with curved sides and no corners. As with all things cookery, the choice of equipment is crucial. Ideally, for a 2-3 egg omelette, a 17-21cm diameter pan. If too big, the eggs will spread out thinly like a slim pancake and will easily dry out. If too small, it will become spongy and thick. The size is also important for ease of folding the omelette. You will also need a heat proof spatula or use the fork if one is not available.

Tip 5. Use the right amount of butter and high smoke point oil – a knob and 1 teaspoon. The oil will stop the butter from burning because it is important for the pan to be preheated to medium heat. As soon as the butter melts and froths, start swirling around to coat the whole pan base and sides.

Tip 6. Keep the heat medium and not high. Impress the Chef by asking if his rings are normal or idiosyncratic as all stovetops are unique. Allow the butter to froth a little but not to burn.

Pour in the eggs without moving the pan and wait for 15 seconds – but the time, as with all things Cookery, depends on the eggs and your heat source. So, apply your Cookery Awareness and look for the bubbly frill as per Step 1 below.

Tip 7. Cooking action and folding for each type:

For the traditional Country Style omelette:

Step 1. After the 15 seconds you will note that a bubbly frill will appear round the edge of cooking omelette. Now tilt the pan to fill up any empty spaces and using a heat proof spatula or fork, draw the edges of the omelette from the edges to the centre. Tip the pan to help the uncooked liquid egg to flow into the empty spaces.

Step 2. After about another 30 seconds there will be a little liquid egg left on the surface of the omelette. You will also see an uneven surface with egg curds and this is desired. Pat down to flaten or move some of the curds if they are very uneven.

Depending on how soft you want the curds and keeping in mind that the omelette will continue to cook, turn off or take off the heat. You don't want to continue to brown the omelette as this will toughen the egg white albumin. If he asked for a cheese and ham or mushroom (have to be previously cooked) omelette, now is the time to add them.

Step 3. Start folding by running the fork or spatula around the whole edge to dislodge any stuck edges. Tip the pan and using a spatula or fork to lift up one half side onto the other. Once folded onto itself, add a little butter to the internal edge and let cook. This will brown the bottom surface.

Step 4. Now you are ready to invert the omelette onto a plate. Keep it in a moon shape and bang the pan onto a chopping board to dislodge it and move it to edge of pan with the omelette lip slightly over the edge of the pan.

Step 5. Grab the pan with your hand as shown and slide omelette off the pan onto a plate. The browned side will come out on top.

For the Classic French Style omelette

For this one, it is usually made with fresh herbs: parsley, tarragon, chervil and chives. Add the herbs and seasoning before you start mixing and using a fork mix like above.

For the different action and fold:

Step 1. We want the pan to be low to medium hot for this one – no browning. Again apply your Cookery Awareness and look for a bubbly frill appear round the edge of cooking omelette. Normally in around 20 seconds.

Step 2. Now using a fork or spatula, the action is a brisk left to right spreading the mix around the pan from all sides whilst also shaking the pan from side to side. This action is completely different to the last action. Keep mixing for as long as to keep the mix soft – 30 secs. for 3 eggs will do.

Step 4. The folding action:

- Tip the skillet to move all of the mixture to one side and run the fork around the edge to dislodge.

- Pick up higher lip and fold down……..keep folding over the side to half moon shape

- Now pick the pan and bang it on a chopping board to dislodge the side against pan edge to come up above pan lip.

- Once over the pan lip, fold onto itself……..Now would be the time to add any cheese or tomato etc. into the lip of the omelette. Fold the protruding omelette lip to the centre bringing the two together.

Step 5. Plating. Grab a plate and don't tip over until the omelette is dislodged and ready to tip over. If not dislodged, bang it again against a chopping board to dislodge. Now grip the pan handle from above and tip over.

Now present the classic French style omelette with soft and creamy inside. Any prospective employer should be impressed!

Note that these 2 omelettes are folded and they are preferred to a flat one with exposed top to show off your skills to a prospective employer. For flat ones just proceed to before the fold action and add any toppings if desired.

Again, as with all things Cookery, practice perfecting omelettes to develop your Cookery Awareness. Become aware of how the beaten eggs are reacting to the two different techniques, whilst also always being aware of the heat level on the egg mixture. With this developed awareness you will be able to demonstrate your competence level every time.

A final point to note is that for a French style omelette you may be asked for a "soft airy texture like a croissant" ……..apply your Cookery Awareness and whisk longer until there are absolutely no streaks.

You have now reached the end of Module Eleven – Frying. As a principle of cooking it is a method you will need to perfect. For qualification, you must complete Assignment Eleven and submit the assignment including suitable evidence or other relevant proof of attainment of the skill level to your tutor.

Assignment Eleven – Frying

Just go to our site or click here to go to student login secure area. After login access Module Eleven Assignment and follow instructions. Submission instructions follow with the assignment and they may include documentation, pictures and or video to attach. Your tutor will assess, and send you a notification when marked.