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Dairy and Food Process & Products Technology
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Lecture - 48
Types of Available Milk

9So, in our this food Dairy and Food Products Process and Products Technology this is
10our forty eighth class right and we will discuss today on milk of course, that is the base;
11milk is available in the market in different forms. Liquid milk as what you get every day
12that we have dealt with elaborately that pasteurized, homogenized milk which you get,
13everything we have said; now we should know also; so what some other types of milk
14which are available in the market right? So, let us look into that.

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Different forms of Milk:-

- A. Raw milk - fresh, unpasteurized milk straight from the cow.
- B. Whole milk - contains no less than 3.25% milk-fat.
 - It must contain not less than 8.25% solids-not-fat. *SNF*
 - Almost all whole milk marketed is also fortified with vitamin
- C. Low-fat milk - has had sufficient milk-fat removed to bring the levels between 0.5 and 2%.
 - It also contains at least 8.25% solids-not-fat. It must contain 2000 IU of vitamin A per kg. Vitamin A is added to offset its loss caused by removal of some of the

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17And for that different milks which are available in the market, we can say that raw milk
18which is available as fresh, unpasteurized milk straight from the cow, which we use to
19get. I do not know how many of you have gone to different milkman and different
20milking places, but in our childhood we had no other option other than going to those
21milk man and we used to get it directly from the cow there.

22So, that is the one which is even I am not saying it is not true in urban, but in rural
23definitely it is still there right. In rural India it is definitely still there, that people are

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1going directly and buying milk from the milkman, straight away from the cow. So, that is
2the one major part that is unorganized sector, but still huge volume of milk is utilized or
3is being supplied by the rural folk right.

4So, another one is the whole milk, which contains no less than 3.25% milk fat. So,
5minimum 3.25% milk fat the other they we said if you remember, that milk is priced
6based on the fat content primarily based on the fat content milk is priced right. Therefore,
7whole milk, which we refer to, is the milk, which contains 3.25% milk fat. It must also
8contain not less than 8.25 % solid not fat SNF right this SNF must be again not less than
98.25% almost whole milk marketed is also fortified with vitamin.

10Nowadays when you get milk, when it is in the market you will see that it is fortified.
11Fortification means adding externally for the good cause right. That can be with vitamin
12that can be with minerals, that can be with protein or that can be with anything. So,
13anything which you are adding for the good cause for the good health, for the betterment
14of the product we improve the product selling to improve the product not only quality,
15but its value then it is called fortification. So, now, a days you get also may fortified milk
16and primarily with vitamins fortified vitamin A or vitamin D they are fortified.

17Then low fat milk which has sufficient, milk fat to remove to bring the levels of 0.5 and
182% right. So, low milk fat this also has different names. So, we said 0.5 or 2% as it is
19available in the market. It also contains at least 8.25% solid not fat and it must also
20contain around 2000 IU of vitamin A per kg of milk that is also mandatory right.

21Vitamin A is added to offset is loss caused by the removal of some of the fat; because
22vitamin A and D they are fat soluble right. So, and milk contains enough, I mean good
23quantity of vitamins both A and D. So, if e is it is particularly A, if it is removed if the fat
24is removed then along with fat, this vitamin is also removed from the milk. So, that is
25why externally this vitamin A is added to the tune of third 1000IU so, that the loss of
26vitamin is compensated due to the they when you are removing the fat, that then this
27vitamin fortification can remove the loss of vitamin right.

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milk-fat. You can find milk in this category labeled:

- 1. low-fat
- 2. 2% milk
- 3. 1% milk

D. **Skim milk** - also called nonfat milk, has had sufficient milk-fat removed to bring the level to less than 0.5%. It must contain not less than 8.25% solids-not-fat and must be fortified with vitamin A.

E. **Chocolate milk** - is made by adding chocolate or cocoa and sweetener to 2% milk. It must be fortified with Vitamin A and addition of vitamin D is optional.

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3So, you can find milk in this category leveled, they are one low fat, 2% milk; 3 one
4personal milk and this low fat could be 0.5% milk right which we have already said
5right. So, there is for low fat milk; another one is skim milk which is available, and this
6is also contained this is also called nonfat milk right and it has sufficient milk fat remove
7to bring the level to the tune of 0.5% of fat. It also should contained 8.25% solid not fat
8and must be fortified with vitamin A.

9This is also mandatory by the regulations of the milk authority, this kind of definitions
10are introduced otherwise anybody can sell anything. So, you have you have remove fat.
11So, you have removed to vitamins fat soluble vitamins. So, your depriving the customer.
12So, that you cannot deprived customer, the authority regulatory authorities they have
13made this mandatory or this kind of cap on the on the on the vitamin or solid not fat or
14fat content of the of the milk right. So, skim milk case like that.

15Then some other milk like chocolate milk right; obviously, from the name chocolate
16milk, it is appear that you must have chocolate fortification or chocolate addition right
17so, that the flavor test could be similar to the chocolate. So, that is the chocolate milk in
18many countries, this is popular right. So, this is made by adding chocolate or cocoa and
19sweetener to 2% milk that is why that we said different milk. So, this 2% milk is used for
20chocolate milk right. So, you adding externally chocolate or cocoa so, that you get the
21chocolate flavored milk.

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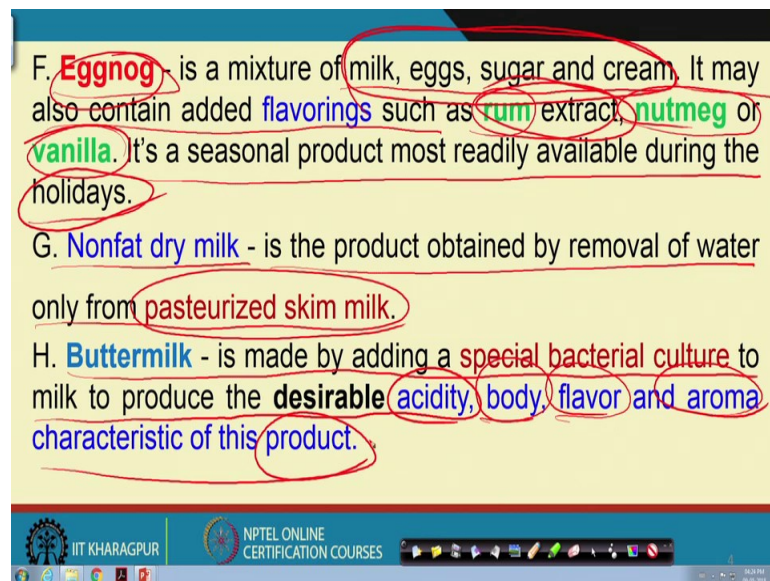
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1It must to be fortified also with vitamin A and addition of vitamin D is optional. Since
2you are during fat again you supplement the vitamins with externally addition externally
3adding vitamin A and vitamin D you are supplementing the loss, you are compensating
4the loss due to the removal of fat, because you are brought down fat content to 2% and
5then you have added chocolate or cocoa and so, vitamin A and D either vitamin A only or
6vitamin A and D. If you D is optional, but A is not optional, A is a mandatory right that
7has to be added for chocolate milk right.

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F. **Eggnog** is a mixture of milk, eggs, sugar and cream. It may also contain added **flavorings** such as **rum** extract, **nutmeg** or **vanilla**. It's a seasonal product most readily available during the holidays.

G. **Nonfat dry milk** - is the product obtained by removal of water only from **pasteurized skim milk**.

H. **Buttermilk** - is made by adding a **special bacterial culture** to milk to produce the **desirable acidity, body, flavor and aroma** characteristic of this product.

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10Then eggnog right this is another name eggnog right. So, this eggnog says that it is a
11mixture of milk, egg, sugar and cream. So, all four together milk, egg, sugar and cream
12they are in combination forming the eggnog. And this it may be also contain added flavor
13such as rum extract or nutmeg or vanilla. So, depending on who is liking which flavor.
14So, these are the flavors which may be added like rum extract or nutmeg or vanilla to this
15right.

16So, basically it is the that eggnog is combination of milk, egg, sugar and cream along
17with flavoring compound or flavoring materials like extract from the rum or maybe from
18nutmeg or maybe from vanilla these are added externally so, that the flavor is according
19to the choice or liking of the customer.

20So, its seasonal product and most readily available during holidays right; so depending
21on liking area etcetera typically in developed countries because their choices are many so

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1that is why though we are we do not see in our country so, much other than in typical
2cities in big cities another, a grade cities typical. So, you may get it is not of course, can
3be said in particularly that you will get, but it is the available in our country also where
4because it depends on the test and liking of the people right.

5All over the world definitely you are food habits, food liking are I mean human
6dependent on human right it is not necessarily that what you like has to be liked by me or
7what I like has to be liked by you that is why so, many varieties so, many things I have
8been developed all over the world right this is one such eggnog.

9Then nonfat dry milk right from the word nonfat dry milk dry of course that means
10moisture is not there it is dried and non fat that is you have already removed the fat that
11is skim. So, nonfat dry milk is another one which is that dried skim milk also it can be
12called.

13So, is the product obtained by removal of water only from the pasteurized skim milk? So,
14pasteurized skim milk pasteurization here is required, because you have killed all the
15pathogen and during drying process. So, there could be some more killing of the
16organisms, but pathogen killing has to be ensured that is why pasteurization is minimum
17that you have done pasteurization and skim milk is the basis from which you are making
18it right; then buttermilk. So, this is another which is buttermilk made by adding a special
19bacterial culture, to milk to produce desirable acidity, desirable body, desirable flavor
20and desirable aroma characteristic of the product right.

21That is the characteristic of the product buttermilk which you are getting from
22fermentation by adding some culture right known culture, which you know that this will
23develop this much of acidity and the body will be like this, flavor and the aroma will be
24this. So, you can tell that to be a special bacterial culture is added to the milk to produce
25the acidity, body flavor aroma of the characteristic product that is the buttermilk.

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This concentrate is then homogenized, fortified with vitamin D, packed in cans, sealed and sterilized by heat.

J. **Sweetened condensed milk** - is a canned whole milk concentrate, prepared by **evaporating enough water**, under vacuum, from fresh whole milk to reduce the volume by half.

- It is pasteurized and sugar added to prevent spoilage.

K. **Whipping cream** is the fat of whole milk. • **Heavy cream** contains a minimum of **36 percent fat**, while **light whipping cream** contains **30 to 36 percent fat**.

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3So, this concentrate is the is then homogenized you have mix them and we have cultured,
4then it is homogenized and then fortified with vitamin D, packed in cans sealed and then
5sterilized by heat right. So, your canning and sterilizing. I do not know whether I have
6told you earlier, I do not remember if I had told then a reputation, but I cannot stop
7telling since it has come. Canning is such a product is such a process, it is not only in
8milk not only in liquid food, but also in solid foods many. You might have seen canned
9juices, you might have seen canned pineapples, canned mango canned rasgulla these are
10available in the market.

11Now, this canning is altogether have different industry, where the cans are basically I
12remember I had told quickly that from different sheets right from different sheets, metal
13sheets they are made and the cans depending on your size whether it is half kg or one kg
14according to that, the volume is taken up and there is no welding or there is no sealing.
15This sealing is done by the seaming this process is called seaming. That you have taken
16sheet and that sheet you have made a fold like this I hope I had said like this, another
17sheet you have taken I made a fold like this.

18So, you have too such and then this you have made this is one right this is one and this is
19another. So, this four you have made like this and now pressed. So, which some pressing
20element you have pressed. So, all these four layers 1, 2, 3, 4 the all these four layers and
21then pressed and it becomes leak proof, that is the uniqueness of the tin can rather right.

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1Can containers are never sealed with welding or any other heat sealing method, this is
2exactly like that and by seaming this is done and products are inside.

3It is, nice that there is no usually, I am not saying abnormally the usually there is no way
4that externally something we will come in or from internal something we will go out
5right and you have seen that this cans are available for years together may be one year,
6two year there is there is no such limitation that within such and such type this has to be
7right. Though, in absence it is a mandatory, when you are selling a product in an
8enclosure so that enclosure must have the date of manufacture and date of expiry. So,
9expiry will be written, but generally it is many years or couple of years right ok. So, that
10is how these sterilized and canned things are available right.

11Then sweetened condensed milk; sweetened condensed milk is another item which is a
12canned whole milk concentrate prepared by evaporating enough water under vacuum
13from fresh whole milk, it reduce the volume by half. From fresh whole milk the volume
14of the milk is reduced roughly to the half, that is what the concentration is made right.

15So, whatever you had the volume is made to half and this concentrated be prepared by
16evaporation and enough quantity of water is removed under vacuum right. This is
17sweetened condensed milk, it is pasteurized and sugar is added to prevent spoilage. So,
18in this case sugar acts as the as the preservative; sugar acts as the preservative.

19So, sugar is added and that is why it is sweetened also its preserves both the purposes. (1)
20it is sweetening and (2) it is acting as the preservative right and original milk is boiled of
21or rather the moisture is remove the level of 50% right is made to half that is what you
22said right. So, this way and it is pasteurized it is pasteurized because pasteurization is a
23must to ensure the removal of all the pathogen right.

24Then whipping cream, there are different forms different names of creams available in
25the different named and the fat contains are also different. So, there those are that this
26whole milk this is from the whole milk heavy cream that contains a minimum of 36
27percent fat right is minimum of 36% fat in the cream. Then light whipping cream that
28contains around 30 to 36% fat right light whipping cream that also contains around 30 to
2936% fat. So, heavy cream is around minimum 36% or more and light whipping is 30 to
3036%. So, depending on the fat content there naming are also different right.

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L. Half-and-half - a blend of milk and cream has 10 to 12 percent fat.

M. Sour cream - with 18 percent fat, is cream that has been soured by lactic-acid bacteria.

N. Yogurt - is a milk product with a custard-like consistency. It is made by fermenting partially skimmed milk with special acid-forming bacteria.

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3Then half and half right blend of milk and cream, this is called half and half blend of
4milk and cream that is 10 to 12 percent fat. This contains 10 to 12 percent that is half of
5right half and half the blend of milk and cream, which contains 10 to 12 percent fat. So,
6fat content is very high you know generally in ice cream ice cream is also called heavy
7fat that is why all over the world. Nowadays, since we have become very much causes
8and the fat content of the ice cream also reduced by generally ice cream also do content
9around 10 to 12 percent fatso that is heavy fat. So, half of that is why it is called half and
10half is a blend of milk and the cream, which to together forms 10 to 12% of the fat right.

11Then sour cream, which has 18 percent fat this is very high fat 18 percent fat and is
12cream is and is cream that has been soured by lactic acid bacteria right. So, already you
13have lot of fat and it is also sour. So, the souring has been made by incorporating or
14inoculating; this is the world inoculating lactic acid forming bacteria and this inoculum
15that is lactic acid forming bacteria makes the milk sour, which is liked by many people
16you will think why it has become sour. So, the milk is spoiled may not be; the many
17people may like that soured milk.

18So, they for them this milk is typically made by the fermentation of lactic acid forming
19bacteria and they this is called LAB lactic acid forming bacteria LAB right. So, they for
20lactic acid and mix the milk sour right. So, souring of milk is done by typically lactic

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1acid, but the fat content is very high it is 18% right 18% we have said cream to be around
230 to 36% that is light weeping or heavy weeping cream.

3So, 18% is many not be equal, but it is not so less. So, very high fat content that is why
4may be to make it palatable people would like to have it in a in a form of sour; so in
5souring form. So, they would like to have. So, that is why this lactic acid forming
6bacteria is added. So, that acid is form and it becomes sour right.

7Then another one is called yogurt. Yogurt is very popular all over the world this is also
8another, which is a fermented product of milk right milk fermented and this is by
9fermentation of milk produced where it is like custard I do not know whether you have
10you ever had custard it is a consistency is like the custard like its consistency is like
11custard, but this is also a one fermented one where this some organisms are added.

12So, that the desired flavor acidity is developed, and the consistency becomes equivalent
13to the custard like things right that is which we call yogurt any this yogurt is popular. In
14our country it is more popular in the cities, I do not know about the interior of the
15villagers, but cities it is available, you get many types of yogurt right. And it is made by
16fermenting partially skim milk right partially skim milk it is made from that which
17special acid forming bacteria. So, that is what that acid is being formed by the acid
18forming organism and they make the acid and the flavor right.

19So, we with this today we complete or finish the class because time is no more. So, in the
20next class let us see what we can discuss and complete.

21Thank you.