

**Suiwielprodukte
handleiding
2010**

Nasionale Jeugskou

Suiwelprodukte

(Handleiding)

1. Melk - 'n basiese agtergrond
2. Algemene melk verwerking
3. Melksamestelling
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SLEGS SENIORS

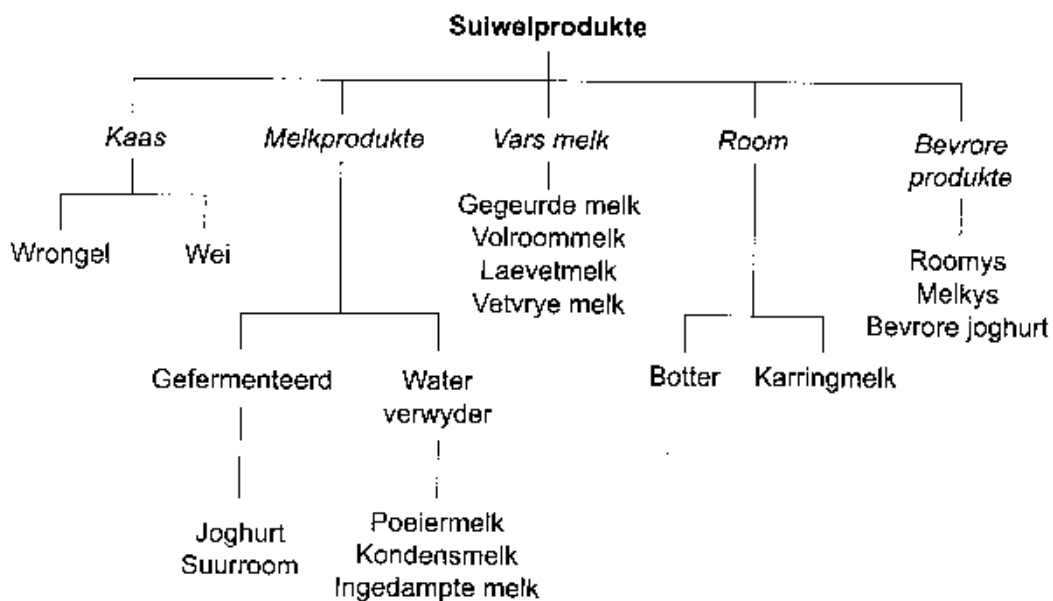
Die handleiding vervang alle vorige handleidings en is die enigste handleiding wat gebruik sal word.

Die handleiding is saamgestel uit inligting van die vorige handleidings van: Ina Jordaan en Stephan Steyn

Tema vir 2010: MPUMALANGA BOER VAN DIE JAAR

Subtemas: SUIWELBEEESTE / VLEISBEEESTE

(Een van die temas moet deur jou tafel voorgestel word)



1. MELK: 'n BASIESE AGTERGROND

Melk is een van die natuur se voedsels, dit is 'n goeie bron van die belangrikste vitamienes, suiker en vir 'n gesonde liggaam.

Melk is 'n vloeistof wat deur die koei vervaardig word van die gras, voer en water wat sy inneem. Melk word natuurlik deur vroulike soogdiere geproduseer nadat hulle gekalf het. Diere wat hulle kleintjies laat suip word soogdiere genoem.

Moeders voed hulle babas met hul eie melk, so ook koeie hulle kalwers, bok- en skaapooie hulle lammers.

'n Koei begin melk produseer nadat sy gekalf het en bly dan vir ongeveer 10 maande in melk indien sy gereeld gemelk word. Gesonde koeie kan tot 18 liter melk per dag lewer, terwyl ander tot 45 liter per dag gee. Kolostrum of biesmelk word in die eerste 7 dae na kalwing geproduseer. Die natuurlike rol van biesmelk is om te voed en immunologiese beskerming aan die soogdier te verskaf. Biesmelk is nie geskik vir die vervaardiging van suiwelprodukte nie.

UITWERKING VAN HITTE OP MELK

Wanneer hitte op melk toegepas word, kan die volgende gebeur:

* Skroei

- Melk kan maklik skroei as die hitte hoog is as gevolg van die melkproteïene wat afsak en koaguleer
- Gebruik 'n dikboomkastrol, dubbelkastrol of stoomketel wanneer jy melk warm maak

* Smaak

Die melk ontwikkel 'n gaar smaak

* Kleur

Die melksuiker (laktose) karamelliseer, verbruin en gee aan die melk 'n roomkleurige voorkoms

* Velvorming

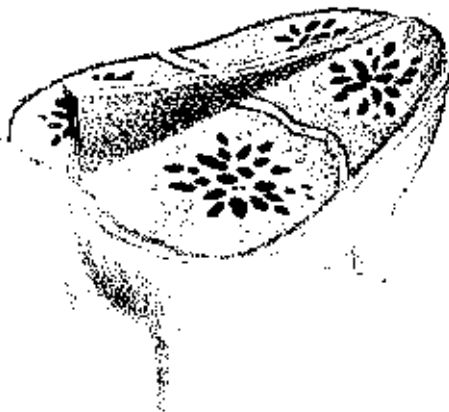
- Melk moet net tot onder kookpunt verhit word. Klein borreltjies sal teen die kante van die kastrol verskyn
- Indien die melk verder verhit word, sal daar skuim op die oppervlak vorm. Dit gebeur omdat daar gasse in die melk vorm tydens verhitting. Die melkproteïene stol by 80°C en styg te-same met vet en mineraalsoute na bo. Die gasse en gestolde stowwe vorm klein blasies en staan bekend as skuim. Die water verdamp van die melkoppervlak en die uitgeskeide en gestolde proteïene vorm 'n velletjie
- Die vorming van 'n velletjie kan verhoed word deur die kastrol te bedek, deur die melk te roer of deur 'n lagie gesmelte smeer om die rand van die kastrol

- Die velletjie vang die stoom vas wat veroorsaak dat die melk oorkook

MELK OP DIE PLAAS

Op sommige plase oor die wêreld heen word koeie nog met die hand gemelk, soos dit reeds van die vroegste tye gedoen is. Koeie word elke dag deur dieselfde persoon gemelk, en gestimuleer om te sak (melk uit te laat), al hoor hulle net die voorbereidings wat die melk proses vooraf gaan. Om met die hande te melk neem aansienlik langer. Medium tot groot melkplase maak gebruik van masjiene, wat die melk deur middel van vakuum uit die spene suig.

Melk verlaat die uier met die temperatuur op $\pm 37^{\circ}\text{C}$. Vars melk van 'n gesonde koei is vir alle praktiese doeleindes vry van bakterieë. Die melk moet egter so gou as moontlik behandel word teen infeksie. Mikro-organismes wat die melk kan bederf is oral, die uier, die werkers se hande, in lug en water asook die koei se hare en vel.



'n Deursnit van 'n koei se uier. Daar is vier kwadrante, elk met sy eie spene.





Ten spyte al die voorsorg, is dit onmoontlik om melk algeheel kiemvry te hou. Melk is 'n goeie gasheer en bevat al die nodige eienskappe vir die kweek van bakterieë, wat onmiddellik begin groei sodra dit met melk in kontak kom.

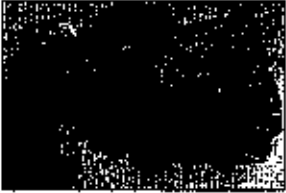

Verkoeling van melk is belangrik, andersins sal dit tot niet gaan. Mikro-organismes, vermeerder vinnig by die temperatuur van 37°C . As verkoeling begin, groei die bakterieë stadiger. Melk moet so gou as moontlik verkoel word na 4°C nadat dit die uier verlaat het. By die temperatuur is die werking van bakterieë baie laag.



Verskillende kase gemaak van melk: Maaskaas, Gouda, Camembert, Blou kaas en Brie

KLASSIFIKASIE

Klassifikasie	Voorbeelde	Beskrywing
Baie harde kaas	Parmesan en Pecorino 	Die kaas het 'n skerp, pikante smaak en die kleur wissel van 'n ligte tot donker strooikleur. Die kaas neem lank om ryp te word en het 'n lae waterinhoud. Die kase rasper moeilik, maar kan in gerasperde vorm aangekoop word.
Harde kaas	Beleë Cheddar, Cheddar, Provolone, Emmenthal, Edam en Beleë Gouda 	Redelike skerp gegeurde kase met 'n sterk smaak en ferm tekstuur. Beleë cheddar word met 'n swart waslaag bedek. Die kaas kan met sukses in geregte gebruik word.
Semi-sagte kaas	Gouda en Drakensberg 	Die kaas het 'n sagte, romerige tekstuur met 'n sagte, aangename geur. Hierdie kase word nie dikwels in geregte gebruik nie. Drakensberg is donkerder geel as gouda.
Semi-sagte kaas: Skimmelkaas	Blaauwkrantz en Roquefort 	Penicillium-spore word by bakteriese kultuur gevoeg en die kaas ontwikkel 'n blou aar van binne af. Dit het 'n skerp, prikkelende soutsmaak.

Klassifikasie	Voorbeelde	Beskrywing
Sagte, rypgemaakte kaas	Camembert en Brie 	Die kase het 'n hoë vloeistof inhoud wat die sagte, romerige tekstuur verseker. 'n Wit, eetbare skimmellaag bedek die kaas.
Sagte, vars kaas	Maaskaas, Roomkaas en Mozzarella	Kaas met 'n wit, sagte tekstuur. Roomkaas is sagter as maaskaas wat glad of krummelrig kan wees.
Spesiale kaas	Feta and Ricotta 	Feta word jonk geëet en het 'n sagte, wit krummelrige tekstuur wat in 'n soutoplossing verpak word. Ricotta het 'n lae vetinhoud met min smaak. Dit word in min vloeistof met 'n dun lagie papier rondom die kaas verpak.
Geprosesseerde kaas	Smeerkaas – Gouda of Cheddar word as basis gebruik.	Gewone kaas word gemaal en geurstowwe word bygevoeg. 'n Emulgeerstof word bygevoeg en die kaas word tot 'n gladde, plastiese massa geroer. Sout, peper, kleursel en geurmiddels kan bygevoeg word.



In Moderne Melkmasjien



Melk met die hand

Friesian / Holstein Cow



Ayrshire Cows / Ayrshire I



Jersey Cow / Jersey Koei

2. ALGEMENE MELK VERWERKING

Daar is verskillende verwerkingsprosesse wat die finale produk beïnvloed. Melk word van die verskaffer na die verwerkingsfabriek in vlekvrre staal tenks vervoer. Die fabriek gebruik dan een of 'n kombinasie van die volgende basiese maniere vir die verwerking.

2.1 PASTEURISASIE

Pasteurisasie is hitte behandeling van melk. Dit behels die verhitting tot 'n hoë temperatuur en dan vinnige afkoeling.

Pasteurisasie van melk is 'n belangrike proses. Voordat die bewaring metode uitgevind is was melk 'n gevaarlike bron van infeksie, aangesien dit die ideale teelaarde is vir mikro-organismes. Verkope van onbehandelde melk in Suid-Afrika word beperk weens die moontlike teenwoordigheid van *Brucella* en *Mycobacterium*.

Louis Pasteur



'n Man genaamd Louis Pasteur het ± 100 jaar gelede bevind dat daar skadelike bakterieë in melk is. Die aanwesigheid van die bakterieë, het veroorsaak dat melk vinnig bederf. Pasteur het gevind dat die verhitting van melk tot 'n sekere temperatuur die skadelike bakterieë ver-

nietig. Die proses word genoem pasteurisasie na aanleiding van Pasteur se naam.

LOUIS PASTEUR

Louis Pasteur het belangrike kontribusies gemaak in die organiese chemie gedurende die 19e eeu. Hy is ook die vader in die mikrobiologie veld, en werk met kiem teorie en om te bevestig wat die kiemsiektes veroorsaak.

2.2 STERILISERING

Sterilisasië vernietig mikro-organismes. Die houers word 15-40 minute lank verhit by 104°- 113°C, dan gelaat om geleidelik af te koel. Daar is 'n tweede manier van sterilisasië nl. die houers word op 'n vervoerband geplaas en 15 – 40 minute deur stoom tot 107°-113°C verhit. Daarna beweeg dit deur koue lug om weer af te koel. Die raklewe van gesteriliseerde melk is langer as dié van gepasteuriseerde melk.

2.3 HOMOGENISERING

Tydens homogenisering word die bottervet globules almal afgebreek na ongeveer dieselfde grootte. Die verspreiding van die vetglobules is van so 'n aard dat geen roomlaag bo-op die melk gevorm word nie, anders as in die geval van onghomogeniseerde melk. Hierdie melk het 'n romeriger smaak en is makliker verteerbaar.

2.4 EHT PROSES

Gedurende die ultra hoë temperatuurbehandeling word melk blootgestel aan 132-140°C vir 2-4 sekondes, daarna word die melk vinnig afgekoel en volgens 'n spesiale metode verpak. Die EHT-behandeling dood alle mikro-organismes wat nie tydens pasteurisasië vernietig word nie, en verseker daarmee dat die produk 'n lang raklewe het. Geen preserveermiddels word bygevoeg nie.

Melk word in kartonhouers verpak, met 'n raklewe van meer as 'n jaar, sonder verkoeling. Algemeen bekend as "lang lewe" melk.

2.5 STANDAARDISASIE

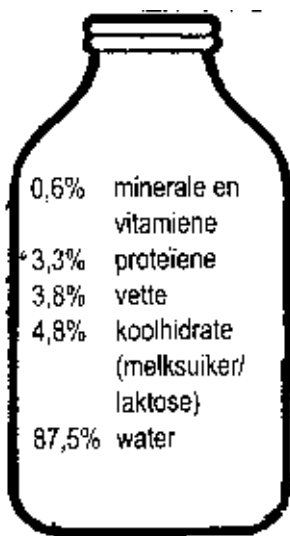
Die aanbevole vetgehalte van volmelk is 3,3%. Hierdie proses word toegepas om die vetinhoud te verminder of vermeerder. Tydens die proses word gebruik gemaak van sentrifugale krag.

Standaardisasie kan ook gedoen word deur die byvoeging van room om die vetinhoud te vermeerder of afgeroomde melk om die vetinhoud te verminder.

3. MELKSAMESTELLING

Melk is 'n vloeistof wat die melkkliere van 'n soogdier produseer om die soogling te voed. Melk is 'n gebalanseerde voedsame voedsel en bevat maklik verteerbare proteïene, asook essensiële nutriënte, vette, laktose, vitamieë en minerale soute.

Die samestelling van melk is:



Die melk van verskillende soogdiere verskil redelik, weens die samestelling daarvan.

SAMESTELLING VAN MELK (PERSENTASIE GEMIDDELD)

TIPE	VET	PROTEÏENE	LAKTOSE	MINERALE	VASTE STOWWE
Bok	3,5	3,1	4,6	0,79	12,0
Buffel	7,6	3,8	4,9	0,78	17,0
Donkie	1,2	1,7	6,9	0,45	10,2
Kameel	4,9	3,7	5,1	0,70	14,4
Koeie	4,5	3,8	4,9	0,72	13,9
Mens	4,5	1,1	6,8	0,20	12,6
Olifant	15,1	4,9	3,6	0,76	26,9
Skaap	5,3	5,5	4,6	0,90	16,3
Walvis	34,8	13,6	1,8	1,60	51,2

SAMESTELLING VAN MELK VAN VERSKILLENDE BEESRASSE
(PERSENTASIE GEMIDDELDES)

TIPE	PRODUKSIE LITER	VET	PROTEÏENE	LAKTOSE	VASTE STOWWE
Fries	4220	3,5	3,3	4,86	12,3
Ayrshire	3120	3,8	3,5	4,69	12,9
Guernsey	2910	4,2	3,9	4,91	14,6
Jersey	2653	4,9	3,9	4,94	14,9

WATER (SMAAKLOOS)

Melk bestaan uit ± 87% water. Die groot persentasie water maak van melk 'n vloeistof.

3.1 VETTE

Die ryk romerige smaak van melk is van die vette teenwoordig. Melkvette toon die meeste variasies van alle komponente van melk. Hierdie vet is aanwesig in die vorm van globules wat in die melk rond dryf. Elke druppel is met 'n membraan omhul. Die membraan verhoed die vetglobules om te verbind. Melkvet is ligter as die water waarin dit gedispenseer is, en styg na die oppervlak in die vorm van room na dit 'n rukkie gestaan het. Daarom word melk gehomogeniseer om die vet in deeltjies op te breek en egalig te versprei in die melk.

3.2 LAKTOSE

Laktose (melksuiker) is verantwoordelik vir die effense soet smaak van melk. Laktose word deur melksuurbakterieë gebruik om energie te skep vir die groei. Gedurende die proses vorm melksuur wat die melk dik maak. Hierdie proses word tydens maak van maas, kase en joghurt gebruik.

3.3 MELK PROTEÏENE (SMAAKLOOS)

Die wit kleur van melk is die refleksie van lig kolloïdaal verspreide kaseïen en kalsiumfosfaat. Melkproteïen is van hoë gehalte. Dit bevat al die essensiële aminosure en is in dieselfde groep as vleis, vis, kaas en eiers. Melkproteïen is bekend as kaseïen en laktalbumien en laktoglobien (weiproteïen).

KASEÏEN: Kaseïen vorm (stol) wanneer melksuur bakterieë of ensieme soos rennien bygevoeg word. Dit is 'n belangrike aspek vir kaasvervaardiging.

WEIPROTEÏENE: Weiproteïene word gekry in die vloeistof wat gevorm word wanneer die melk dik word, gedurende kaasvervaardiging. Verhitting veroorsaak ook die dik word van weiproteïene.

3.4 MINERALE (EFFENS SOUT)

Minerale is belangrik weens die hoë voedingswaarde. Die belangrikste mineraal in melk is KALSIMUM. Kalsium is nodig vir die vorming van sterk bene en tande.

Ander voorbeelde van minerale in melk is: natrium en magnesium.

4. VARIASIES IN SAMESTELLING (SLEGS VIR SENIORS)

Sonder dat die verbruiker van 'n verskil bewus word, kan byvoegings tot melk gemaak word, daarom is daar 'n wettige minimum.

Die volgende faktore is van belang ten opsigte van die variasies in die samestelling van melk.

4.1 ALGEMENE FAKTORE

Verskillende beesrasse se melkvet persentasie verskil ook. Die melk van 'n Jersey koei is gewoonlik romeriger as die van 'n Frieskoei.

4.2 BESTUURFAKTORE

PERIODES TUSSEN MELKTYE

Die tydsverloop tussen melkings het die meeste invloed op die vetinhoud van die melk. Laatmiddag melk is gewoonlik romeriger as oggend melk.

AANTAL MELKINGS PER DAG

Meer melk word verkry, met drie melkings per dag, in plaas van twee melkings.

KUDDE BEHANDELING

Met ongunstige toestande sal 'n koei minder melk, met minder vetinhoud lewer, soos bv. as sy skrik gemaak word tydens die melkproses.

4.3 LAKTASIE

Die laktasie periode is die tyd wat die koei in produksie is. Die hoeveelheid melk wat geproduseer word vermeerder geleidelik en bereik 'n maksimum ± 60 dae na kalwing. Na 300 dae word die koei nie meer gemelk nie, en die periode tot die volgende kalwing word die "droë periode" genoem.

4.4 VOEDING

Die kwaliteit van voer beïnvloed die kwaliteit en kwantiteit van melk. Te veel voer is net so nadelig as te min voer.

4.5 SEISOENE EN TEMPERATURE

Die samestelling van melk word beïnvloed deur die seisoene en temperatuur. Baie warm of koue weer verlaag die melkproduksie en verhoog die vetinhoud.

4.6 OUERDOM VAN KOEI

Die samestelling van melk verander na gelang van die ouderdom van die koei.

4.7 UIER INFEKSIE

Mastitis het 'n groot invloed op die samestelling van melk. Die inhoud van vette, laktose en kaseïen verminder terwyl die weiproteïen vermeerder.

'n Koei met mastitis word met antibiotika behandel, waarna die antibiotika ook in die melk aanwesig is. As die melk vir die maak van kaas of gefermenteerde produkte gebruik word, sal dit die werking van die bakterieë beïnvloed. Mastitis melk is nie geskik vir menslike gebruik nie.

Uier infeksie of mastitis is die resultaat van hoofsaaklik bakteriologiese infeksie van die uier. Die mikro-organismes dring die uier deur die speenopening binne, of deur 'n besering.

4.8 SIEKTES OORGEDRA DEUR MELK

Melk word besmet met mikro-organismes deur (die koei, die melkman, of melktoerusting) soos:

Brucella abortus (maltakoors)
Staphylococcus aureus (voedselvergiftiging)
Eberthella typhi (maagkoors)

Kook, pasteurisasie, of sterilisering van melk vernietig hierdie kieme. Melkkuddes word gereeld vir siektes getoets. Die toetse bring aan die lig of melk van behandelde koeie enige spore van antibiotika bevat. Die medisyne word in die koei se bloedstroom opgeneem en van daar in die melk. Melk wat antibiotika bevat is gevaarlik vir menslike gebruik, aangesien die medisyne nuwe-effekte vir die verbruiker kan inhou.

5. FISIIESE EIENSKAPPE VAN MELK

5.1 DIE GEUR EN SMAAK VAN MELK

5.2 DIE KLEUR VAN MELK

Sien bo vanaf 3.2 tot 3.5

5.3 SUURHEID EN pH

Melk sal 'n suurheid toon al word dit direk na die melking getoets. Dit is bekend as natuurlike suurheid van melk. Die titreerbare % suurheid van Fries melk varieer tussen 0,14 tot 0,17. Koeie met 'n hoër vet en proteïënhoud soos Jerseys se titreerbare % suurheid wissel tussen 0,15 en 0,18.

Die suur of alkalieë van 'n produk word bepaal deur die pH.

Die pH skaal:

'n Produk met 'n pH van 7, is neutraal

'n Produk met 'n pH laer as 7, is suur soos bv. vrugtesappe

'n Produk met 'n pH hoër as 7, is alkalies soos bv. seep

Die pH van gewone vars melk kan wissel tussen 6,6 tot 6,75.

5.4 VRIESPUNT VAN MELK

Vriespunt van water is 0°C. Met enige byvoegings (bv. sout of suiker) sal die vriespunt van water daal.

Die vriespunt van melk wissel tussen -0,520°C en -0,550°C. Die hoeveelheid laktose, proteïëne en minerale beïnvloed ook die vriespunt.

Indien water by die melk gevoeg is, sal die vriespunt vermeerder, d.w.s. die vriespunt sal nader aan 0°C wees. Deur melk te vries kan jy vasstel of water bygevoeg is om die volume te vermeerder.

Byvoeging van melkpoeier of versuring van melk sal die vriespunt verlaag, m.a.w. laer as 0°C af. Hierdie kan nie met sekerheid getoets word, soos in die geval van water nie.

'n Jersey koei se melk, met 'n hoë persentasie vaste stowwe, se vriespunt sal ongeveer -0,525°C tot -0,530°C wees, terwyl 'n Fries koei se melk met minder vaste stowwe, se vriespunt -0,515 tot -0,525 sal wees.

5.5 DIE DIGTHEID VAN MELK

Melk is effens swaarder as water. Digtheid van melk wissel tussen 1,028 en 1,034. Die digtheid van water is 1. Die digtheid van melk is van belang, om vas te stel of water by die melk gevoeg is.

5.6 KOOKPUNT VAN MELK

Melk se kookpunt is effens hoër as 100°C, op seevlak en 98°C bo seevlak.

5.7 AANKOPE VAN MELK

Melk aankope word gebaseer op die volgende:

- * Vetinhoud
- * Proteïene
- * Hoeveelheid melk gelewer (liters)
- * Bakterieë telling

6. DOELTREFFENDE REINIGING

Reiniging is die verwydering van melkaanpaksels in die melk kontakpunte van die melkmasjien. Indien die proses nie geskied nie, sal dit 'n negatiewe effek op die kwaliteit van die melk hê, wat deur die melkmasjien beweeg. Om goeie kwaliteit melk te verseker moet dit vermy word.

WAT IS REINIGING

Die doel van reiniging van die melkapparaat is om mikrobakterieë te beheer. Reiniging behels die verwydering van enige ongewenste materiaal, en mikro-organismes wat infeksies veroorsaak. Reiniging moet so gou as moontlik na 'n melking gedoen word.

Die reiniging van stilstaande masjinerie word gedoen met water. Gewoonlik word die metode van (in die plek) gebruik, dit is wanneer die toerusting nie verwyder kan word nie. Dit is die mees algemene skoonmaak manier, van

pyplyne en ander dele van die stilstaande masjien in die melkbedryf. Die melkmasjien op die plaas word op dieselfde wyse skoongemaak alhoewel daar verskillende maniere is om die watervloei toe te pas. Hierdie metode en ander doeltreffende maniere van reiniging sal in die volgende bladsye bespreek word.

Skoon toerusting is vry van sigbare onsuiverhede.

Mikrobiologiese skoon toerusting verwys daarna dat so min mikro-organismes teenwoordig is dat, die hoeveelheid en kwaliteit van moontlike besmetting van melk geen praktiese belang vir die kwaliteit van melk inhou, in terme van gesondheid of die gehalte van die produk.

Kliniese skoon toerusting bevat so min vreemde materiaal dat chemiese besmetting van die melk laer is as die aanvaarbare standaard.

Algemeen, sal die melk kontak oppervlak skoon voorkom en voel, wanneer dit behoorlik gereinig is. Die hoeveelheid mikro-organismes, gewoonlik bakterieë, sal hopelik so min wees dat die vereiste vir mikrobiologiese skoon bereik is.

WATTER TIPE BESMETTING MOET VERWYDER WORD?

Na die melkproses is die melktoerusting vuil met oorblyfsels van vloeibare melk asook droë materiaal van melk. Die hoofbestanddeel van ou melk (oorblyfsels) word maklik met water skoongemaak en verwyder. Nogtans is dit soms moeilik om van die laaste deeltjies ontslae te raak, daarom is die moeilikste taak van reiniging om die laaste oorblyfsels te verwyder.

Melkoorblyfsels bevat, behalwe ander elemente, ook vette en proteïene, wat 'n gunstige omgewing en beskerming vir bakterieë bied. Alhoewel melk ook bakterieë bevat wat vinnig sal vermeerder as dit nie verwyder word nie. Vir die stryd teen bakterieë is die verwydering van melkoorblyfsels 'n goeie begin, aangesien die oorblyfsels die teelaarde vir bakterieë is.

Alhoewel meeste van die oorblyfsels verwyder is, kan bakterieë teenwoordig wees op sigbare skoon oppervlakte. Met gunstige omstandighede kan 'n bio-film vorm, wat moeilik verwyder word. Daarom is dit baie belangrik om voorsorg te tref dat bio-film gevorm word nie.

'n Ander tipe besmetting wat van melk en harde water gevorm is, is melksteen, 'n harde laag wat hoofsaaklik gevorm word van elemente van kalsium en magnesium. Behalwe dat dit die melktoerusting vuil laat voorkom, bied dit ook 'n hawe en beskerming vir mikro-organismes.

WATTER DELE VAN DIE MELKMASJIEN MOET SKOON GEMAAK WORD?

Basies moet die hele melkmasjien, wat in kontak met melk was, skoon gemaak word.

Die dele kan in 3 groepe verdeel word:

Die eerste groep is die dele wat die melk berg, gedurende melk asook die vakuum. Hierdie dele is die melk eenhede, melk meters, die melklyn (pyp) en die ontvanger.

Die tweede groep bestaan uit die vervoerpyp tussen die ontvanger en die melktenk, asook die melkpomp en soms die plaatverkoeler. Melk beweeg in die vervoerpype sonder die hulp van 'n vakuum.

Die melktenk is die laaste en die derde groep. Die rede waarom die melkmasjien in drie groepe verdeel word, is omdat die dele op verskillende wyses gereinig word.

Nie net die binnedele van die melkmasjien word gereinig nie. Die omgewing rondom die masjien, soos die melkkamer en die melkstal asook die buitekant van die melkmasjien soos bv. klose moet gereinig word.

WATTER FAKTORE IS NODIG VIR REINIGING?

Reiniging is die basiese proses om oorblyfsels van die toerusting te verwyder. Om die reinigingsproses so doeltreffend moontlik te maak, word 4 belangrike faktore saamgevoeg.

Die faktore is:

Meganiese aksie
Temperatuur
Wasmiddels
Tyd

Water is nodig vir 'n goeie werking verrigting van die faktore, vir 'n bevredigende skoon resultaat.

MEGANIESE AKSIE

Die verwydering van neerslae geskied deur meganiese aksie. Die hoeveelheid of sterkte van die meganiese aksie benodig, sal verskil na aanleiding van die aard die reste wat verwyder moet word. Meganiese aksie kan op verskeie maniere soos skrop, borsel, spoel en hoëdrukbespuiting aangewend word.

Die melkmasjien sowel as die melktenk kan op een of beide metodes gereinig word.

WASMIDDELS

Wasmiddels word in verskeie soorte wasmiddels soos anionies, kationies en nie-ionies verdeel. Wasmiddels bestaan soms uit al die soorte. Suur-wasmiddels word gebruik om die mineraalneerslae op toerusting oppervlakte op te los en in suspensie te hou sodat dit tydens spoeling verwyder word. Nog 'n belangrike taak van wasmiddels is om te verhoed dat kalsium en magnesium, melksteen vorm.

TEMPERATUUR (HITTE)

Temperatuur is een van die kritiese faktore wat die werkverrigting van wasmiddels beïnvloed. Oor die algemeen kan gesê word dat hoe warmer die oplossing (tot 80°C) is, hoe beter die funksionering. Temperatuur is van besondere belang by die verwydering van vette.

TYD

Die kontaktyd tussen wasmiddels en die neerslag wat verwyder moet word, moet voldoende wees om die neerslag volkome te verwyder. Meeste skoonmaakaksies van wasmiddels berus op chemiese reaksies op prosesse wat 'n spesifieke tyd nodig het om plaas te vind.

WATER

Soos reeds genoem, is water om verskeie redes belangrik tydens die reiniging- proses. Water dra die wasmiddels asook die hitte en beïnvloed die meganiese aksie tydens reiniging.

Die afvoer van oorblyfsels is nog 'n belangrike taakverrigting van water, aangesien die reste die wegstroomplek van mikro-organismes is. Met behulp van wasmiddels, hitte en turbelensie water, word die oorblyfsels verwyder en opgelos, waarna dit maklik verwyder kan word. Die verwydering is belangrik ten opsigte van die suksesvolle skoonmaak van die melkmasjien.

Alhoewel water die hoofelement in die reinigingproses is, bevat dit ook 'n groot hoeveelheid onsuiverhede, wat die skoonmaakproses kan kelder. Tipe elemente waarna verwys kan word as onsuiverhede is kalsium, magnesium en ander elemente wat water verhard.

AANSLAG OP OPPERVLAK

Indien die reiniging onsuksesvol was, sal melk oorblyfsels sigbaar wees op verskillende dele van die melkmasjien. Inspeksie is daarom die korrekte wyse om seker te maak dat die reinigingproses doeltreffend was.

TIPE NEERSLAG	BESKRYWING
Vette	Vetterige neerslae op die oppervlak
Proteïene	Blou rerënboog kleurige vernisagtig
Melksteen	Wit na geel neerslae
Yster	Rooi tot bruin of swart
Bakterieë	Rooi tot pienk/pers kleur vlekke
Rubberdeeltjies	Swartagtige oorblyfsels

7. VERVAARDIGING VAN SUIWELPRODUKTE OP KLEIN SKAAL

SAMEVATTING

Die vervaardiging van suiwelprodukte was van die vroegste tye 'n tuis industrie. Die voorbereidings tegnieke is van geslag tot geslag oorgedra tot vandag. Sommige van die tegnieke word vandag nog gebruik, al verskil is dat vandag meer moderne toerusting gebruik word, om produkte op groot maat te vervaardig.

Die vervaardiging van suiwelprodukte kan lonend en bevredigend wees. Daar is tog enkele aspekte wat in aanmerking geneem moet word alvorens jy begin.

NB. Goeie gehalte melk verseker 'n kwaliteit produk

Hoe laer die bakterieë telling van melk is, hoe beter produk kan vervaardig word. Die samestelling van melk is ook van groot belang, aangesien dit die hoeveelheid en smaak van die eindproduk bepaal, bv. Jersey melk lewer 13% kaas, terwyl Friese 10% lewer.

Alle toerusting moet vooraf gewas en ontsmet word. Die foute in die vervaardiging van die proses kan vermy word as spesiale aandag aan die aspek gegee word. Suiwelprodukte vervaardiging is 'n biologiese proses en is direk afhaklik van die temperatuur, tyd en kultuur.

Daar moet rekening gehou word dat daar 'n moontlike tydverskil in variasie kan wees. Streef ten alle tye vir die beste kwaliteit. Onthou: kwaliteit verkoop. Ondervinding kom met oefening. Die vervaardigingprosedures wat hier verskyn, het in baie tydskrifte ook verskyn en is deur verskeie entrepreneurs getoets, met baie goeie resultate. In hierdie weergawe is van die

resepte en metodes verander om sekere aspekte meer verstaanbaar te maak.

MAAK TUIS JOGHURT

INLEIDING

Joghurt is een van die bekendste suurmelkdranke. Dit het 'n verfrissende, skoon smaak en bevat nie net dieselfde voedingswaarde as melk nie, maar verteer ook makliker. Voordelige terapeutiese eienskappe word deesdae aan suurmelk gekoppel. Na behandeling met byvoorbeeld antibiotika kan joghurt gebruik word om die natuurlike mikroflora van die spysverteringskanaal te herstel. Spesifieke melksuur bakterieë, wat in die melk ingeënt word, besit die vermoë om die melk in 'n gefermenteerde melkdrink, met 'n unieke tekstuur, smaak en geur te verander. Die organismes wat gewoonlik gebruik word in die vervaardiging van joghurt is *Streptococcus thermophilus* en *Lactobacillus bulgaricus*.

Ander organismes met voordeliger eienskappe vir die gesondheid is nou kommersieël beskikbaar. Dit is organismes soos: *Lactobacillus*, *Acidophilus* en *Bifidobacterium* spesies.

WENKE

Die joghurt kultuur moet altyd vars wees. Met ou kultuur sal die melk nie stol nie of dit sal langer neem om te stol. Daar kan ook nie onbepaald van 'n kultuur joghurt gemaak word nie. Van tyd tot tyd moet daar met 'n nuwe vars kultuur begin word.

Die behoorlike verhitting van die melk is uiters belangrik om alle skadelike bakterieë te dood. So nie sal die joghurt 'n onaangename reuk en smaak na die broeiperiode ontwikkel.

Alle toerusting soos houters, lepels, ens. moet voor gebruik deeglik met seep gewas en met kookwater afgespoel word. Dit moet nie afgedroog word na afspoeling nie.

Hou die melk verkieslik in die houer waarin dit verhit is. As die melk na verhitting en afkoeling in ander houters oorgegooi word, moet die houters eers skoongemaak word, soos hierbo beskryf. Werk te alle tye so skoon en steriel as moontlik.

'n Koelsak kan ook gebruik word om die temperatuur konstant te hou nadat die melk tot 42°C afgekoel is. Draai die verseëlde houer waarin die melk is in koerantpapier toe voor dit in die sak geplaas word.

8. BASIESE RESEPTE VIR KLEINSKAALSE PRODUKSIE

VERSOETE VRUGTE JOGHURT

INLEIDING

Joghurt produksie met die gebruik van 'n tweeklaarstafie en dubbelkoker.

APPARAAT

- Vlekvrye staal dubbelkoker (die een kastrol moet in die ander pas om 'n waterbed te vorm)
- Tweeklaar stafie, verlengkoord, dubbelprop
- Ketel vir kookwater vir sterilisasie
- Ys vir afkoeling van die produk
- Vlekvrye staal lepel en klitser vir meng en klits
- Termometer
- Fermentasiehouers, gasbottels is perfek
- Fermentasiehouers (koelhouer)
- Skoonmaak- en ontsmettingmiddels
- Skaal, meetlepels, bekere
- Handklitser
- Papierhanddoek/servette
- Kombuis sif

FORMULASIE

Afhangende van die geur- en kleurmiddels wat gebruik word:

- Melk 1 liter
- Wit suiker 30 gram
- Afgeroomde melkpoeier 30 gram
- Stabiliseerder 8 gram (opsioneel)
(Gebruik 1% meer melkpoeier indien stabiliseerder weggelaat word)
- Joghurt kultuur YC-X11 mespunt (3 - 5 korrels)
- Vrugtepulp/konsentraat 100 ml

METODE

- Meng stabiliseerder, suiker en afgeroomde melkpoeier. Hierdie is die vooraf vermenging van droë bestanddele.
- Pasteuriseer teen 87°C vir 10 minute en roer aanhoudend. As 'n stabiliseerder gebruik word, maak seker van die regte pasteurisasie tydperk.
- Koel af na inkubasie temperatuur van 40-42°C.
- Voeg joghurt kultuur by.
- Meng die joghurt kultuur sorgvuldig met die produk, maak seker die kultuur is goed opgelos.
- Vul fermentasiebottels terwyl die temperatuur konstant by 40-42°C gehou word.
- Plaas fermentasiebottels in fermentasiehouer wat vooraf verhit is tot 42°C. Warm water kan in die fermentasiehouer bygevoeg word om die temperatuur op 40-42°C te hou.
- Toets die pH na 3-4 ure. Die produk moet 'n dikker tekstuur vertoon.
- As die produk 'n pH van 5 bereik het, haal die bottels versigtig uit die koelhouer en laat oornag in die yskas. 'n pH is as die produk dik is en wanneer dit geskep word die lepel 'n merk laat van die lepel in die produk.
- Die volgende oggend moet die temperatuur <20°C en die pH ±4,5 wees sonder sinerese bo-op (water-op).

- Skep die dun lagie room bo-op die joghurt af.
- Meng die gewone joghurt tot glad.
- Voeg en meng die kleur- en geurmiddels by.
- Vul houers en seël
- Laat 8-12ure in koelkamer voor gebruik.
- Hierdie is die tweede set, wat die geur behoorlik kans gee om te ontwikkel en vermeng met die joghurt. Die verlangde smaak en dikte is sigbaar na die periode.

VERSOETE DRINK JOGHURT

INLEIDING

Joghurt produksie met die gebruik van 'n tweeplaatstofie en dubbelkoker.

APPARAAT

- Vlekvrye staal dubbelkoker (die een kastrol moet in die ander pas om 'n waterbed te vorm)
- Tweeplaat stofie, verlengkoord, dubbelprop
- Ketel vir kookwater vir sterilisasie
- Ys vir afkoeling van die produk
- Vlekvrye staal lepel en klitser vir meng en klits
- Termometer
- Fermentasiehouers, gasbottels is perfek
- Fermentasiehouers (koelhouer)
- Skoonmaak- en ontsmettingmiddels
- Skaal, meetlepels, bekere

- Handklitser
- Papierhanddoek/servette
- Kombuis sif

FORMULASIE

Afhangende van die geur- en kleurmiddels wat gebruik word:

- | | |
|--------------------------|-------------------------|
| - Melk | 1 liter |
| - Wit suiker | 50 gram |
| - Afgeroomde melkpoeier | 10 gram |
| - Joghurt kultuur YC-X11 | mespunt (3 - 5 korrels) |
| - Gekeurde konsentraat | 100 ml |

METODE

- Meng suiker en afgeroomde melkpoeier. Hierdie is die vermenging van droë bestanddele.
- Pasteuriseer teen 87°C vir 10 minute en roer aanhoudend.
- Koel af na inkubasie temperatuur van 40-42°C.
- Voeg joghurt kultuur by.
- Meng die joghurt kultuur sorgvuldig met die produk, maak seker die kultuur is goed opgelos.
- Vul fermentasiebottels terwyl die temperatuur konstant by 40-42°C gehou word.
- Plaas fermentasiebottels in fermentasiehouer wat vooraf verhit is tot 42°C. Warm water kan in die fermentasiehouer bygevoeg word om die temperatuur op 40-42°C te hou.
- Toets die pH na 3-4 ure. Die produk moet 'n dikker tekstuur vertoon.
- As die produk 'n pH van 5 bereik het, haal die bottels versigtig uit die koelhouer en laat oornag in die yskas. 'n pH 5 is as die produk dik is en wanneer dit geskep word die lepel 'n merk laat van die lepel in die produk.
- Die volgende oggend moet die temperatuur <20°C en die pH ±4,5 wees sonder sinerese bo-op (water-op).

- Skep die dun lagie roombo-op die joghurt af.
- Meng die gewone joghurt tot glad.
- Voeg en meng die kleur- en geurmiddels by.
- Vul houer en seël.
- Laat 8-12 ure in koelkamer voor gebruik.
- Hierdie is die tweede set, wat die geur behoorlik kans gee om te ontwikkel en vermeng met die joghurt. Die verlangde smaak en dikte is sigbaar na die periode.

MAAS

INLEIDING

Maas produksie met die gebruik van 'n tweeplaatstofie en dubbelkoker.

APPARAAT

- Vlekvrye staal dubbelkoker (die een kastrol moet in die ander pas om 'n waterbed te vorm)
- Tweeplaatstofie, verlengkoord, dubbelprop
- Ketel vir kookwater vir sterilisasie
- Ys vir afkoeling van die produk
- Vlekvrye staal lepel en klitser vir meng en klits
- Termometer
- Fermentasiehouers, gasbottels is perfek
- Fermentasiehouers (koelhouer)
- Skoonmaak en ontsmettingmiddels
- Skaal, meetlepels, bekers
- Handklitser

- Papierhanddoek/servette
- Kombuis sif

FORMULASIE

Afhangende van die geur- en kleurmiddels wat gebruik word:

Melk	1 liter
Starch Pharma	5 gram
Maas kultuur	CHN-22 mespunt (3-5 korrels)

METODE

- Roer droë bestanddele in melk.
- Pateuriseer teen 85-87°C vir 30 minute en roer af en toe.
- Koel af na inkubasie temperatuur van 22-24°C.
- Voeg Maas kultuur by.
- Meng die Maas kultuur sorgvuldig met die produk, deur dit vir 3 minute te roer.
- Vul bottels.
- Plaas fermentasiebottels in fermentasiehouer wat vooraf verhit is tot 22-26°C. Die produk kan in die somer oornag buite gelaat word. Wintertyd kan dit langer neem aangesien die temperatuur laer is.
- Toets die pH na 8-12 ure.
- As die produk 'n pH van 4,6 bereik het, verwyderdie fermentasiehouer en laat 8-12 ure in yskas verspreiding. Die produk is gereed wanneer die houer waarin die Maas omgedraai word en die produk nie vloei maar dik genoeg is om regop te bly

9. PUNTESTAAT EN TOEKENNING VAN PUNTE

Die kategorieë van die beoordeling is soos volg:

- | | | |
|-----|---|--------------|
| 1. | Geskrewe teorie toets | (20) |
| 2. | Vorbereiding | (50) |
| 2.1 | Produkte wat gemaak moet word: | |
| | i) Joghurt (gewone, aarbei en 'n ander geur) | |
| | ii) Drink yoghurt (gewone, aarbei en 'n ander geur) | |
| | iii) Maas (suurmelk) | |
| 3. | Blindproë | (20) |
| 4. | Tafel voorstelling | (10) |
| | TOTAAL: | [100] |

1. TEORIE

Die teorie toets bestaan uit 25 vrae. 5 Vrae sal algemene kennis wees. Die totaal van 25 vrae sal verwerk word na 'n punt uit 20. Junior en Senior deelnemers sal verskillende toetse aflê.

2. VOORBEREIDING

Beoordeling van die voorbereiding sal apart per produk gedoen word. Aan die einde van die voorbereidingsproses sal al die verskillende items se punte bymekaar getel word en verwerk word vir die totaal vir die voorbereiding.

SLEGS DIE VOLGENDE SAL IN DIE VOORBEREIDINGLOKAAL TOEGELAAT WORD

- * Alle apparaat benodig vir die voorbereiding en lewering van die voorgeskrewe produkte. Dit behels alles genoem in die resepte vir die produksie
- * 'n Resep met die basiese bestanddele en metode en produksie van die produk

BEOORDELING VAN VOORBEREIDING UIT DIE VOLGENDE
ONDERAFDELINGS:

Voorbereiding	(10)
Higiëne	(15)
Apparaat	(10)
Proses	(15)
Totaal:	[50]

3. PROE

Beoordeling van die smaak sal vertroulik gedoen word. Dit is wanneer 'n onbetrokke persoon die trekking van nuwe individuele nommers sal doen. Die produkte word dan geplaas volgens die nuwe nommers vir die proe sessie. Die beoordelaars of onafhanklike beoordelaar kan die produkte proe sonder dat hulle beïnvloed word, deur vooraf kennis wie die produk vervaardig het.

Oorspronklikheid van die "ander" geur van die joghurt sowel as die drink joghurt sal in die guns van die deelnemer tel, dit sal die produk meer uniek maak. Iets uniek sal 'n beter punt verdien as die doodgewone geure van elke dag.

TELLING KAARTE VIR DIE PROE AFDELINGS SAL UIT DIE
VOLGENDE ONDERAFDELINGS BESTAAN:

Voorkoms en kleur	(2)
Tekstuur	(7)
Geur en aroma	(11)
Totaal:	[20]

4. AANBIEDING

Die totaal van die persentasie van die produkte vervaardig is 10 punte. Oorspronklikheid van die uitstalling en die gebruik van die tema vir die jaar sal in ag geneem word.

'n Tafel sal tot jou beskikking wees vir die aanbieding, verder moet jy alles self voorsien.

10. AANHANGSEL A

1. VOORBEREIDING

Bring die toepaslike benodigde items, kombuisgereedskap en apperate moenie gedeel word nie. Elke deelnemer is verantwoordelik vir al sy eie gereedskap.

2. HIGIËNE

Houtlepels is onaanvaarbaar, weens onhigiëne. Gebruik vlekvrystaal- of plastieklepels en gereedskap vir meer higiëne. Houtitems is die ideale broeiplek vir bakterieë.

Gebruik deurgaans twee oplossings vir u gebruikte items. Die eerste oplossing is 'n jik/milton oplossing en word gebruik om die ongebruikte items in te laat staan. As 'n item benodig word, spoel dit eers in warm water (gekookte) af, en dan kan dit in die produk gebruik word. As u die item gebruik het, spoel dit onder lopende water af en plaas direk terug in die ontsmetting oplossing (jik of milton).

KLEREDRAG IS SOOS VOLG EN VERPLIGTEND

Lang denimbroek en T-hemp (geborgde)
Toe witterige tekkies
Haarbedekking (borg pet of haarnet)
Voorskoot - wit (laboratorium/chefjas is ook aanvaarbaar)

3. APPARAAT/GEREEDSKAP

'n Dubbelkoker word aanbeveel. Deelnemers kan gebruik maak van 'n klein vlekvrystaal kastrol in 'n groot aluminium kastrol gevul met water. Dit verlaag die kans om die melk te laat aanbrand. Die melk kan ook makliker konstant gehou word by 85-87°C.

Plastiekbakke kan gebruik word vir opwasdoeleindes. Glasbottels word aanbeveel vir sterilisasie en die voortdurende skoonmaak van items tydens die vervaardigingproses.

Termometers moenie konstant in die kastrol gehou word tydens verhitting nie. Dit is nadelig vir die termometer om te alle tye aan hitte blootgestel te word.

4. PROSES

Droë bestanddele moet in die lokaal afgemeet word, dit vorm deel van die beoordeling.

Droë bestanddele, behalwe die kultuur, moet eers droog gemeng word en daarna met die melk terwyl dit nog koud is. As die droë bestanddele vooraf vermeng word met 'n bietjie melk, vergemaklik dit die oplossing in die koue melk. 'n Sif kan gebruik word om van die klonte in die droë bestanddele ontslae te raak.

Wees vertrouwd met die pasteurisasie vereistes, indien 'n stabiliseerder gebruik word. Verkry die verlangde tydsduur en temperatuur vereistes van die verskaffer vir die korrekte gebruik van die stabiliseerder en kultuur.

Hou die resepte konstant. Maak seker die korrekte droë bestanddele word by die regte resep gevoeg.

Handgeskrewe/Gedrukte resepte moet in die voorbereidingslokaal wees. 'n Voorgestelde resep is deel van die handleiding.

5. AANBIEDING

Hou dit verband met die tema?

Vorm die produkte deel van die uitstalling en is dit aptytwekkend voorgesit?

6. EKSAMEN

Die teorie toets sal saam met al die ander toetse geskryf word. Die vraestel sal deur die beoordelaar opgestel word.

7. ALGEMEEN

Bring u eetgerei en etekaartjie saam na die lokaal, middagete word gewoonlik vir die 2 dae by die lokaal genuttig. Bring iets ekstra te drink saam, die kombuis is warm en die tyd lank. Die beoordelaar sal kultuur en vrugte aan die deelnemers verskaf. Die tweede geur mag deur die deelnemers self voorsien word.

11. AANBEVOLE VERSKAFFERS

Animal Nutrition and Animal Products Institute Irene (LNR)
Private Bag X2
IRENE
0062

Tel: 012-67233/9297

Regal Fruits (Stephan Steyn)
Posbus 5283
KEMPTONPARK
1620

Tel: 011-9793887/8/9
Faks: 011-9794363
Sel: 076 139 1702

**Dairy Products
Text Book
2010**

National Youth Show

Dairy Products

(Text Book)

1. Milk - A basic background
2. General milk treatment
3. Composition of milk
4. Variations of composition*
5. Physical characteristics of milk
6. Efficient cleaning*
7. Small scale production of dairy products
8. Basic recipes
9. Judging sheets and allocation of points
10. Addendum A
11. Preferred suppliers

ONLY SENIORS

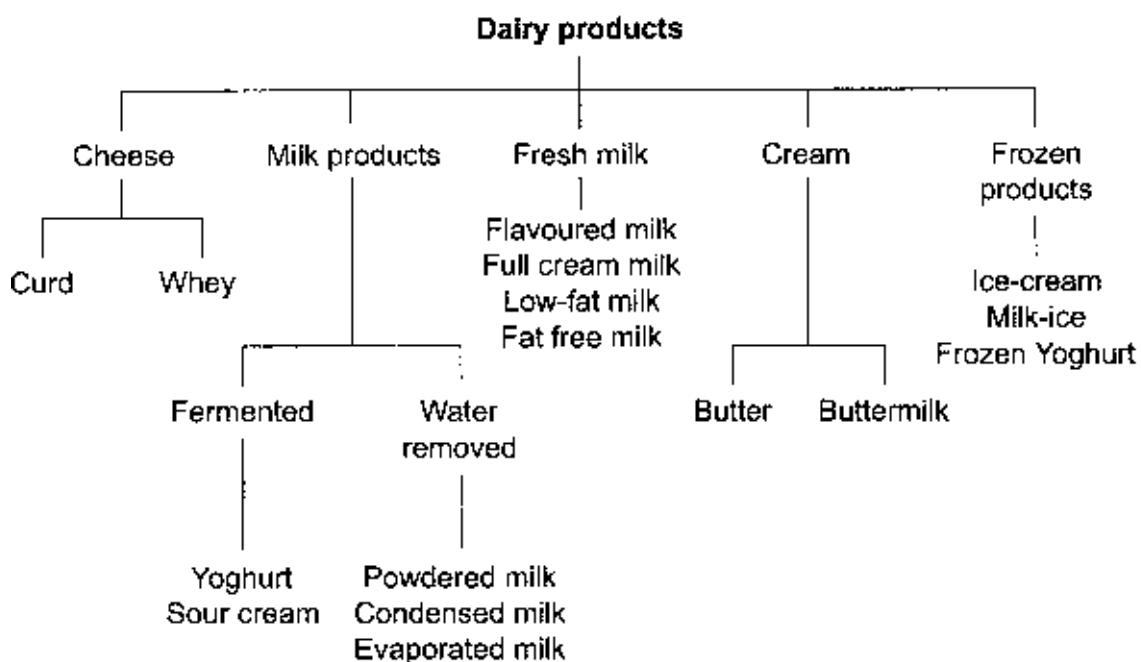
This manual replaces all previous manuals and is the only manual that will be used.

This manual is compiled of information found in previous manuals written by:
Ina Jordaan and Stephan Steyn

Theme for 2010: MPUMALANGA FARMER OF THE YEAR

Subtitle: DIARY CATTLE / BEEF CATTLE

(One of these themes must be illustrated on your table)



1. MILK: A BASIC BACKGROUND

Milk is one of nature's most complete foods, containing many of the vital vitamins, proteins, sugar and minerals which help us to grow, give us energy and good health.

Milk is a liquid that is formed by the cow, of the grass, hay and water that she intakes. Milk is produced naturally by all female mammals when they give birth. Animals that suckle their young are called mammals.

Just as our mothers fed us their milk, so do cows feed the calves, nanny goats their kids and ewes their lambs.

A cow will not give milk unless she has a calf. When the calf is born, the cow will be in milk for about ten months, as long as she is milked regularly. Healthy cows can give up to 18 litres of milk a day, some can give up to 45 litres per day. Milk obtained the first seven days after calving is called colostrum or beestings. Beestings is important to young calves because it protects them against diseases. The milk is also rich in nutrients that make them grow strong. Beestings not suitable for the making of dairy products.

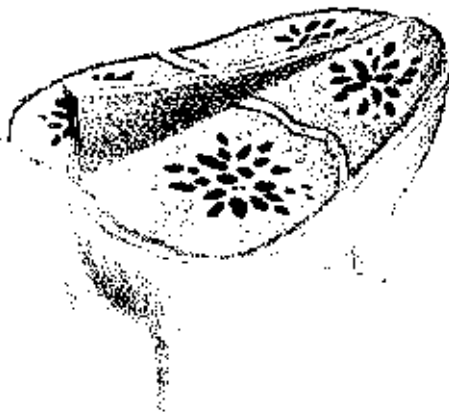
MILK ON THE FARM

On many farms all over the world milking is still done by hand, in the same way as it has been done for thousands of years. Cows are milked by the same people every day and are quickly stimulated to let down just by hearing the familiar sounds of preparations for milking. Milking by hand takes a long time. On medium-to-large farms with large herds, the usual practice is to milk cows by machine. The milking machine sucks the milk out of the teat by vacuum.

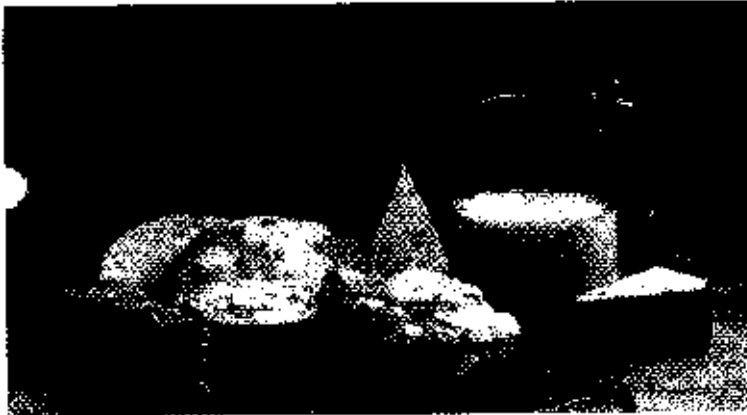
Milk leaves the udder at a temperature of about 37°C. Fresh milk from a healthy cow is practically free from bacteria, but it must be protected against infections as soon as it leaves the udder. Micro-organisms capable of spoiling the milk are everywhere – the udder, the milker's hands in the air and water, on the cow's hair and in the soil.

Despite all precautions, it is impossible to keep bacteria completely from milk. Milk is an excellent growth medium for bacteria – it contains the nutrients they need to grow. As soon as the bacteria get into the milk they start to multiply.

Unless the milk is chilled, it will quickly be destroyed by micro-organism, which multiplies most vigorously at temperatures around 37°C. If milk is chilled, bacteria start growing slower. Milk is therefore quickly cooled to about 4°C after it leaves the cow/udder. At this temperature the level of bacterial activity is very low.

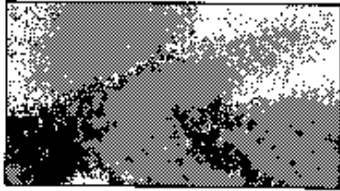
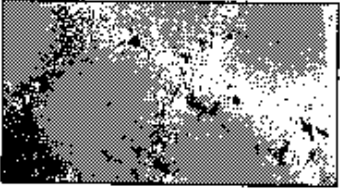




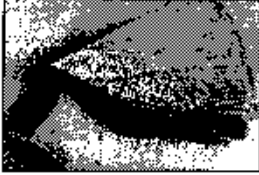
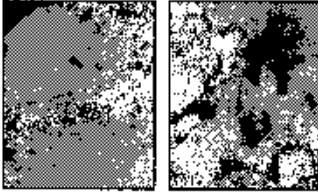
Cross-section of a cows udder. There are four quarters, each with a corresponding teat.



Different cheeses made from milk: Cottage cheese, Gouda, Camembert, Blue cheese and Brie

CLASSIFICATION

Classification	Examples	Description
Very hard cheese	Parmesan and Pecorino 	The cheese has an acrid, pungent taste and its colour varies from a light to a darker straw-colour. The cheese needs a long period to mature and has a low water content. It is difficult to grate but can be purchased grated.
Hard cheese	Mature Cheddar, Cheddar, Provolone, Emmenthal, Edam and Mature Gouda 	Fairly sharply flavoured cheese with a strong taste and firm texture. Matured cheddar is coated with a layer of black wax. This cheese can be successfully used in a variety of dishes.

Semi-soft cheese	<p>Gouda and Drakensberg</p> 	<p>The cheese has a soft, creamy texture and a soft, pleasant aroma and flavour. These cheeses are not often used for cooking. Drakensberg has a darker yellow colour than Gouda cheese.</p>
Semi-soft cheese: veined	<p>Blaauwkrantz and Roquefort</p> 	<p>Penicillin trace elements are added to bacterial cultures and the cheese develops a blue vein from the inside. It has a sharp, pungent, salty taste.</p>
Soft, ripened cheese	<p>Camembert and Brie</p> 	<p>These cheeses have a high fluid content which creates their soft, creamy texture. The cheese is coated in a white, edible, mouldy layer.</p>
Soft, fresh cheese	<p>Cottage Cheese, Cream cheese and Mozzarella cheese</p>	<p>These cheeses have a whiter colour and a softer texture than other cheeses. Cream cheese is softer than cottage cheese which may be smooth or chunky.</p>
Special cheese	<p>Feta and Ricotta</p> 	<p>Feta is eaten while immature. It has a soft, white, crumbly texture. It is packaged in a salt solution.</p> <p>Ricotta has a low fat content and very little taste. It is packed in a small amount of fluid. The cheese is usually covered in a thin layer of paper.</p>
Processed cheese	<p>Soft cheese – Gouda or Cheddar is used as the basis for processed cheeses.</p>	<p>Ordinary cheese is ground and flavoured. An emulsifier is added and the cheese is stirred to a smooth, plastic mass. Salt, pepper, colourants and flavouring may be added.</p>



In Moderne Melkmasjien



Melk met die hand

Friesan / Holstein Cow



Ayrshire Cows / Ayrshire I



Jersey Cow / Jersey Kasi

2. GENERAL MILK TREATMENT

2.1 Pasteurisation is the heat treatment of a milk product. It involves heating and cooling at a specific temperature.

Pasteurisation of milk is a very important process. Before it was introduced, milk was dangerous source of infection because it makes a perfect growth medium for micro-organisms.

The selling of raw milk is not allowed in certain towns in South Africa, primarily due to the possible presence of Brucella and Mycobacterium.

About 100 years ago a man with the name Louis Pasteur discovered that milk had harmful bacteria in it. It was these bacteria which turned milk sour so quickly. Pasteur found that heating the milk to a certain temperature killed the harmful bacteria. This is called pasteurisation, after Pasteur's name.

Louis Pasteur



This is the deliberate modification of milk composition by removing milk fats to reduce the fat content to the required 3,3% or to control the composition of milk products. This process is done by the use of a milk standardiser.

Standardisation can also be done by adding cream to the milk to increase the fat content or decrease the fat by adding skim milk.

LOUIS PASTEUR

Louis Pasteur made important contributions to the field of organic chemistry during the mid-19th century. He is considered the founder of the field of microbiology, working with the germ theory of disease to establish and explain the causes of many diseases.

2.2 STERILISATION

Sterilisation is a heat treatment which will destroy all organisms in the milk, give the milk a brownish colour and make it taste like boiled milk. Flavoured milk is processed from the sterilised milk. The reason that processors use sterilisation instead of pasteurisation is to prolong the shelf life by killing all organisms in the milk. Sterilisation takes place at 110°C to 116°C for 20-40 minutes.

2.3 HOMOGENISATION

Homogenisation breaks up the milk fat globules that are more or less the same size. The distribution of the fat globules is of such a nature that no cream layer forms on top of the milk, as is the case with un-homogenised milk. This milk has a rich cream taste.

2.4 UHT PROCESS

During this process of ultraheat-treatment (UHT), milk is exposed to a temperature of 132-140°C for 2-4 seconds, it's quickly cooled down and packed in a certain way. These products have a long shelf life because UHT destroys all bacteria that aren't usually destroyed during the pasteurisation process. No preservatives are added.

UHT-milk is also packed in boxes and has a shelf life for over one year, even if it is not refrigerated. This milk is generally known as long-life milk.

2.5 STANDARDISATION

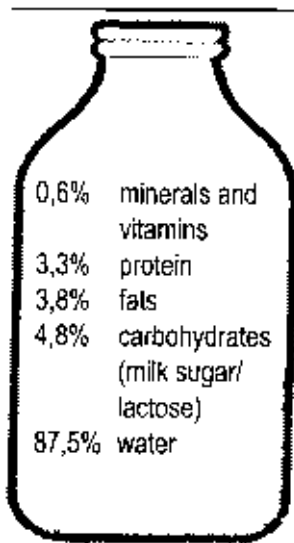
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Standardisation can also be done by adding cream to the milk to increase the fat content or decrease the fat by adding skim milk.

3. COMPOSITION OF MILK

Milk is a liquid that is secreted by the milk gland of mammals to enable them to feed their young. It is a balanced food containing high nutritional value and easily-digested proteins, including the essential amino acids as well as fat, lactose, vitamins and mineral salts.

The main components of milk are:



The milk of various mammals differs vastly regarding its composition.

COMPOSITION OF MILK (PERCENTAGE AVERAGE)

TYPE	FAT	PROTEIN	LACTOSE	MINERALS	SOLIDS
Goat	3,5	3,1	4,6	0,79	12,0
Buffalo	7,6	3,8	4,9	0,78	17,0
Donkey	1,2	1,7	6,9	0,45	10,2
Camel	4,9	3,7	5,1	0,70	14,4
Cow	4,5	3,8	4,9	0,72	13,9
Human	4,5	1,1	6,8	0,20	12,6
Elephant	15,1	4,9	3,6	0,76	26,9
Sheep	5,3	5,5	4,6	0,90	16,3
Whale	34,8	13,6	1,8	1,60	51,2

COMPOSITION OF MILK OF DIFFERENT COW RACES (PERCENTAGE AVERAGE)

TYPE	PRODUCTION LITRE	FAT	PROTEIN	LACTOSE	SOLIDS
Frisian	4220	3,5	3,3	4,86	12,3
Ayrshire	3120	3,8	3,5	4,69	12,9
Guernsey	2910	4,2	3,9	4,91	14,6
Jersey	2653	4,9	3,9	4,94	14,9

3.1 WATER (TASTELESS)

± 87% of milk we drink is water. The high percentage of water makes milk a liquid.

3.2 FAT

the Milk fat gives milk a pleasant rich creamy taste. The milk fat shows greatest variation of all the components of milk. Fat appears in the form of small (globules) floating around in milk. Each drop is covered with a membrane. The membrane prevents the fat from combining. If milk is left to stand for a while, the fat will rise to the top. Therefore milk is homogenized to break the fat into very small pieces and distribute it evenly throughout the milk.

3.3 LACTOSE

Lactose (milk sugar) gives milk a slightly sweet taste. Lactose is used by lactic acid bacteria to provide energy for their growth. In this process lactic acid is formed which causes milk to go sour and later to curdle. This process is used during the manufacturing of maas, cheeses and yoghurt.

3.4 MILK PROTEIN (TASTELESS)

Milk's white colour is caused by the reflection of light by the colloidal dispersed particles of fat and casein. We find protein in lean meat, fish, milk, cheese and eggs. Protein consists of CASEIN and WHEY PROTEIN.

CASEIN

Casein sets (coagulated) in the presence of an acid or an enzyme, rennet. This is of importance when cheese is manufactured.

WHEY PROTEIN

Whey protein is found in the whey (the liquid left when milk forms curd) during cheese making. Heat causes whey protein to coagulate.

3.5 MINERALS (SLIGHTLY SALTY)

Minerals are important because of their nutritional value. The most important mineral found in milk is CALCIUM. Calcium is used by our bodies to make healthy bones and teeth.

Other examples of minerals in milks are: sodium, potassium and magnesium.

4. VARIATIONS IN COMPOSITION (ONLY FOR SENIOR ENTRANTS)

Milk can easily be adulterated, without the consumer noticing. Therefore the law determines the minimum composition of milk.

The following factors are of importance with regards to variations in the composition of milk:

4.1 GENERIC FACTORS

Different breeds give milk different percentages of fat. Milk from a Jersey cow is richer than milk from a Friesian (Holstein) cow.

NUMBER OF MILKING PER DAY

If milking takes place three times a day instead of twice a day, more milk is obtained.

TREATMENT OF THE COW

If a cow is treated abnormally, e.g. being frightened during milking, she will give less milk with a lower fat content.

4.2 MANAGERIAL FACTORS

PERIODS BETWEEN MILKING

The length between milking has the most influence on the fat content of the milk. Evening milk is usually richer than morning milk.

4.3 LACTATION

The lactation period is the time during which a cow gives milk.

The quantity of milk produced gradually increases and reaches a maximum 60 days after calving. After about 300 days the cow is no longer milked. The period that follows is known as the "dry period".

The lactation period lasts from the birth of a calf until the dry period begins. A normal healthy cow will have about 8 lactation periods in her lifetime. A resting period of 2-3 months is allowed before calving.

4.4 FEEDING

The composition of the feed can affect the composition of the milk. Over feeding as well as under feeding are undesirable.

4.5 SEASON AND TEMPERATURE

All the components of milk are influenced by season and temperature. Very hot or cold weather lowers milk production and increases the fat content of the milk.

4.6 AGE OF COW

The composition of the milk changes as the cow gets older.

4.7 UDDER INFECTION

Mastitis has a large influence on the composition of milk. There is a decrease in fat, lactose and casein content. There is an increase in whey protein.

When a cow has got mastitis it is treated with antibiotics. These antibiotics land up in the milk. When this milk is used to make cheese or fermented products it will inactivate the bacteria used. Mastitis milk is not suitable for human consumption.

Udder infection or mastitis is an infection of the udder which is caused by pathogenic micro-organisms. The micro-organisms penetrate the udder through the teat opening.

4.8 DISEASES TRANSMITTED BY MILK

Milk is infected (via the cow, the milkman or milking equipment) with infectious organisms such as:

Brucella abortus
Staphylococcus aureus
Eberthella typhi

Boiling, pasteurising or sterilising milk destroys these organisms. Cows are regularly tested for diseases. Such tests revealed that milk of cows undergoing treatment for a disease contained spores of antibiotics. The medicine is absorbed into the cow's bloodstream and from there into the milk. Milk containing antibiotics is dangerous for human consumption because the medicine may have a negative effect on the consumer.

5. PHYSICAL CHARACTERISTICS OF MILK

5.1 THE TASTE OF MILK

5.2 THE APPEARANCE OF MILK

See above 3.2 to 3.5

5.3 ACIDITY AND pH

Even if milk is tested immediately after milking, an acid reaction is obtained. This is known as the "natural acidity" of milk. The % titratable acidity of normal Friesian milk varies from 0,14 to 0,17. Cows with a higher fat and protein content like Jersey cows have a % titratable acidity of 0,15 to 0,18.

pH is a measure of acid or alkali in a product.

The pH scale:

When a product has a pH of 7, the product is neutral

When a product has a pH below 7, the product is acid for ex fruit juice

When a product has a pH above 7, the product is an alkaline for ex soap

5.4 THE FREEZING POINT OF MILK

The freezing point of water is 0°C. If anything (for e.g. salt or sugar) is added to water, the freezing point will drop.

The freezing point of milk normally varies between -0,520°C and -0,550°C. This depends on the lactose, protein and mineral content of the milk. The presence of these substances in water lowers the freezing point. The minimum specification point of milk is -0,512°C or lower.

Adding water to milk causes the freezing point to rise. In other words, move closer to 0°C.

5.5 THE DENSITY OF MILK

Milk is slightly heavier than water. The density of milk varies between 1,028 and 1,034. The density of water is 1. The density is of importance because adulteration of milk with water can be noticed.

5.6 BOILING POINT OF MILK

Milk boils at a temperature slightly higher than 100°C. at sea level and 98°C above sea level.

5.7 PURCHASING OF MILK

Milk purchases are based on:

- * Fat content
- * Protein content
- * Amount of milk delivered (litres)
- * Bacteriological quality

6. EFFICIENT CLEANING (ONLY SENIORS OF EQUIPMENT)

Cleaning is the removal of milk deposits from all the milk contact points in a milking plant. If this process does not occur the milk quality will enervate and cause negative effect on all subsequent milk passing through the milking system. To ensure top quality milk this must be avoided.

WHAT IS CLEANING

Clean equipment is free from visible impurities.

Microbiologically clean refers to equipment that harbors so few micro organisms that the quantity and quality of a possible contamination of milk is of no practical importance t the quality of milk in relation to health or product quality.

Chemically clean equipment contains so little foreign matter that chemical contamination of the milk is below the relevant standard.

Generally, milk contact surfaces will look and feel clean when properly cleaned. The amount of micro organisms, usually bacteria, will hopefully be so limited that the demand for microbiological cleanliness is met.

WHICH CONTAMINANTS HAVE TO BE REMOVED?

After milking the milking equipment is soiled with residues of liquid milk and air dried films of milk. The main part of this old milk (often called soil) removed by rinsing with water. However the last part is often harder to get rid of. Therefore, the most difficult task of cleaning system is to remove this last soil.

The milk residues consist of, among other things, fats and proteins, which are a delicate substrate and protection for bacteria. Of course, the milk also contains bacteria, which will multiply at a high rate if not removed. For the battle against bacteria, the removal of the milk residues is a good start, since these residues are the main locations for bacteria.

Although most of the residues are removed, bacteria can still attach to visibly clean surfaces. Under favourable conditions they can also form a bio film, which can be very hard to remove. Therefore, it is of utmost importance to prevent the formation of this bio film.

Another contamination, which originates from both milk and hard water, is milkstone, a layer of scale mainly formed by cations like calcium and magnesium. Besides giving the equipment an unclean appearance, milkstone could harbour and protect micro organisms.

WHICH PARTS OF THE MILKING PLANT HAVE TO BE CLEANED?

Basically, all parts of the milking machine which come in contact with milk have to be cleaned.

These parts could be divided into 3 groups:

The first group consists of parts which hold milk as well as vacuum during milking. These are the milking units, milk meters, the milk line and the receiver.

The second group consists of the delivery line between the receiver and the milk cooling tank including the milk pump and sometimes also a plate cooler. It is common for the milk to be transported without the help of vacuum, in the delivery line.

WHAT FACTORS ARE INVOLVED IN CLEANING?

Cleaning is basically the process that removes soil from the equipment which is to be cleaned. In order to make this process as efficient as possible, 4 important factors are combined.

These factors are:

Mechanical force

Heat

Cleaning agents

Contact time

Water is of course the key to get these factors to work towards a satisfying cleaning result.

MECHANICAL FORCE

Soil that has firmly adhered to surfaces in the milking plant needs to be exposed to a mechanical force in order to be loosened. This force is usually exerted by circulating water in the plant, but could also take place through scrubbing or spraying. Both the milking plant and the cooling tank can be cleaned with one or both of these methods.

CLEANING AGENTS

Cleaning agents could be divided into detergents and disinfectants. Often, however the cleaning agents consist of both. Detergents assist in removing the soil by helping to loosen it and to hold it in suspension so that it can be removed during rinsing. Another important task for detergents is to prevent captions like calcium and magnesium forming milkstone.

Detergents can be either alkaline or acid. Often an alkaline detergent is used as the main detergent. Acid detergents are then used e.g. once a week, in order to remove milkstone.

Disinfectants are used to kill microbes. Often disinfectants consist of chlorine or chlorine compounds. In some alternative cleaning systems disinfectants are replaced by the use of heat.

HEAT

The role of heat is to improve the ability of dissolving and emulsifying different materials. Detergents are more easily dissolved when the water is warm. It is important that warm water is used in the removal of fatty materials.

CONTACT TIME

Contact time means that the water, heat and cleaning agents must have sufficient time to perform the cleaning. The time needed varies depending on the cleaning method.

WATER

As mentioned before water is important for the cleaning result for several reasons. It carries cleaning agents and heat, and exerts mechanical action on the surfaces to be cleaned.

The transportation of soil is another important task for water, since the soil is the main hiding place of micro-organisms. With the help of cleaning agents, heat and turbulent water, the soil is suspended or dissolved which makes it easy to remove. This removal is an important step towards the successful cleaning of the milking plant.

At the same time as being a key tool in the cleaning process, water can contain a wide variety of impurities which could jeopardize the cleaning result. Important types of elements, which may be regarded as impurities, are calcium, magnesium and other ions which make the water hard.

ASSESSMENT OF SURFACE

If the cleaning is unsuccessful, soil could be visible at different points in the milking plant. A manual inspection is therefore always an appropriate way of discovering a possible malfunction.

KIND OF DEPOSIT	DESCRIPTION
Fat	Greasy oily appearance of surface
Protein	Blue rainbow hue varnish like
Milkstone	White to yellow deposits
Iron	Red to brown or black
Bacteria	Red to pink/purple colouring of staining
Rubber fragments	Black or blackening residues

7. SMALL SCALE PRODUCTION OF DAIRY PRODUCTS

ABSTRACT

The manufacturing of dairy products was from the earliest time a home industry and the preparation techniques were given down from generation to generation to the present day. Some of the techniques are still used today; the only difference is that more modern equipment is used today to handle manufacturing in a large scale.

Dairy product manufacturing can be highly rewarding and very satisfying. There are however single aspects that have to be taken into consideration before it can be attempted.

NB. Quality milk ensures a quality product

The lower the bacterial count of the milk, the better the product that can be manufactured there from. The composition of the milk is also of great importance, since it determines the yield of the end product, e.g. Jersey milk gives a 13% yield in cheese whilst Fries gives a 10% yield.

All equipment must be washed and disinfected thoroughly beforehand. Most of the defects in the manufacturing process can be avoided by paying special attention to this aspect. Dairy product manufacturing is a biological process and is directly dependent on the temperature, time and activity of the starter culture.

Allowance should be made for possible time variations. Strive at all times for the highest quality sells. Experience comes with repetition. The manufacturing procedures in this book have already been published in various magazines, and have been tested with good results by many entrepreneurs. In this edition some of the recipes and methods have been reviewed to make certain aspects more understandable.

MAKE YOUR OWN YOGHURT

INTRODUCTION

Yoghurt is one of the best known fermented milk products. It has a refreshing, pleasant taste and not only has the nutritional value of milk but is more easily digested. These days fermented milk products are said to have therapeutic properties. Yoghurt can be used to restore the natural micro flora in the intestinal canal after a patient has been treated with antibiotics. Specific lactic acid bacteria, which are inoculated into milk, have the ability to change the milk to a fermented milk product with a unique texture, taste and flavour. The traditional organisms used in the manufacturing of yoghurt are *Streptococcus thermophilus* and *Lactobacillus bulgaricus*.

Other organisms are now commercially available which also have beneficial properties. These include organisms such as *Lactobacillus acidophilus* and *Bifidobacterium* species.

TIPS

Always use fresh yoghurt culture. When an old culture is used the milk will not thicken or will take much longer to thicken. The culture cannot be used indefinitely and therefore a new culture must be started from time to time.

Sufficient (proper) heating of the milk is of utmost importance to destroy all harmful bacteria present in the milk. If this is not done the yoghurt will develop an unpleasant aroma and taste after the incubation period.

All equipment such as containers, spoons, etc. must be thoroughly washed with soap and rinsed boiling water. Do not dry equipment after rinsing.

Keep the milk, preferably in the container in which it was heated. If milk is poured into other containers after the heating and cooling process, these containers should first be cleaned and rinsed as described above. Work as clean and sterile as possible, all time.

A cool bag may also be used to keep the temperature constant after the milk has been cooled to 42°C. The sealed container with milk is wrapped in newspaper before placing it into the cool bag.

8. BASIC RECIPES FOR SMALL PRODUCTION

SWEETENED FRUIT JOGHURT

INTRODUCTION

Easy yoghurt production by using a hot plate and double pot system.

EQUIPMENT

- Double jacket stainless steel pots. (one must fit into another so that one can create a water jacket)
- Hot plate, lead, double plug
- Kettle for making hot water for sterilization
- Ice for cooling the product
- Plastic dish for cooling the product
- Stainless steel ladle and mixers for stir + mix
- Thermometer
- Containers for fermentation, glass jars are perfect for this
- Fermentation box (cooler box)
- Cleaning and sanitizing chemicals
- Scale, measuring utensils

- Handheld eggbeater
- Paper towel
- Kitchen sieve

FORMULATION

Depending on the flavouring and colouring to be used:

Milk	1 lt
White sugar	30 gram
Skimmed milk powder	30 gram
Stabiliser	8 gram (optional) Use 1% more milk powder if you omit the stabilizer)
Yoghurt culture	YC-X11 Knife point (3-5 granules)
Fruit pulp/concentrate	100 ml

METHOD

- Mix stabiliser together with sugar and skimmed milk powder. This is called the premix of the dry ingredients.
- Pasterise at 87°C for 10 minutes while stirring continuously. If you use a stabiliser adapt time to be sufficient.
- Cool to incubation temperature of 40-42°C.
- Add yoghurt culture.
- Mix the yoghurt culture carefully with product, make sure it is dissolved properly.
- Fill fermentation cans whilst maintaining temperature at 40-42°C.
- Put fermentation cans into fermentation box which was preheated to 42°C. You can add hot water in the cooler box to keep the temperature at 40-42°C.
- Check pH after 3-4 hours. Look if the product has gone thicker.
- When pH reaches 5,0 take out cans carefully and put into fridge overnight. The pH is right when the product is thick and when scooped with a spoon leaves a mark of the spoon in the product.

- Next morning the temperature should be $<20^{\circ}\text{C}$ and $\text{pH} \pm 4,5$ without synerises on top (water on top).
- Scoop out thin layer of cream on top of yoghurt.
- Mix the plain yoghurt until smooth.
- Mix in the colouring and flavouring.
- Fill into containers and seal.
- Place into fridge for 8-12 hours before consumption.
- This is for the second set and the flavour will mix with the yoghurt. The desired flavour and thickness will only be visible after this second set.

SWEETENED DRINK YOGHURT

INTRODUCTION

Easy drink yoghurt production by using a hot plate and double pot system.

EQUIPMENT

- Double jacket stainless steel pots. (one must fit into another so that one can create a water jacket)
- Hot plate, lead, double plug
- Kettle for making hot water for sterilization
- Ice for cooling the product
- Plastic dish for cooling the product
- Stainless steel ladle and mixers for stir + mix
- Thermometer
- Containers for fermentation, glass jars are perfect for this
- Fermentation box (cooler box)

- Cleaning and sanitizing chemicals
- Scale, measuring utensils
- Handheld eggbeater
- Paper towel
- Kitchen sieve

FORMULATION

Depending on the flavouring and colouring to be used:

Milk	1 lt
White sugar	50 gram
Skimmed milk powder	10 gram
Yoghurt culture	YC-X11 Knife point (3-5 granules)
Fruit pulp/concentrate	100 ml

METHOD

- Mix sugar and skimmed milk powder. This is called the premix of the dry ingredients.
- Pasterise at 87°C for 10 minutes while stirring continuously.
- Cool to incubation temperature of 40-42°C.
- Add yoghurt culture.
- Mix the yoghurt culture carefully with product, make sure it is dissolved properly.
- Fill fermentation cans whilst maintaining temperature at 40-42°C.
- Put fermentation cans into fermentation box which was preheated to 42°C. You can add hot water in the cooler box to keep the temperature at 40-42°C.
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- Next morning the temperature should be $<20^{\circ}\text{C}$ and $\text{pH} \pm 4,5$ without synerises on top (water on top).
- Scoop out thin layer of cream on top of yoghurt.
- Mix the plain yoghurt untill smooth.
- Mix in the colouring and flavouring.
- Fill into containers and seal.
- Place into fridge for 8-12 hours before consumption.
- This is for the second set and the flavour will mix with the yoghurt. The desired flavour and thickness will only be visible after this second set.

MAAS

INDTRODUCTION

Easy Maas production by using a hot plate and double pot system.

EQUIPMENT

- Double jacket stainless steel pots. (one must fit into another so that one can create a water jacket)
- Hot plate, lead, double plug
- Kettle for making hot water for sterilization
- Ice for cooling the product
- Plastic dish for cooling the product
- Stainless steel ladle and mixers for stir + mix
- Thermometer
- Containers for fermentationl, glass jars are perfect for this
- Fermentation box (cooler box)

- Cleaning and sanitizing chemicals
- Scale, measuring utensils
- Handheld eggbeater
- Paper towel
- Kitchen sieve

FORMULATION

Depending on the flavouring and colouring to be used:

Milk	1 lt
Starch Pharma	5 gram
Maas culture	CHN-22 Knife point (3-5 granules)

METHOD

- Add Starch Pharma to milk in pot whilst stirring.
- Pasteurise at 85-87°C for 10 minutes while stirring occasionally.
- Cool to incubation temperature of 22-24°C.
- Add Maas culture.
- Mix the Maas culture carefully with product, in pot by stirring for 3 minutes.
- Fill into container.
- Put container into fermentation box which was preheated to 22-26°C. Or just leave outside overnight in summer. Winter times may be longer as room temperature is lower.
- Check pH after 8-12 hours.
- When pH is 4,6 take out crates carefully and put into cold room for 8-12 hours before distribution. Product is ready when you turn the bottle in which the Maas is packed upside down and it doesn't flow but is thick enough to stay upright.
- End product of Maas must be thick and solid without synerises or air bubbles.

9. JUDGING SHEETS AND ALLOCATION OF POINTS

Judging will consist of the following categories:

- | | | |
|-----|---|--------------|
| 1. | Written theory test | (20) |
| 2. | Preparation | (50) |
| 2.1 | Products to be manufactured: | |
| | i) Yoghurt (strawberry and any other flavour) | |
| | ii) Drinking yoghurt (strawberry and any other flavour) | |
| | iii) Maas | |
| 3. | Tasting | (20) |
| 4. | Presentation | (10) |
| | TOTAL: | [100] |

1. THEORY

The theory test will consist of 25 questions. 5 of the questions will be on general knowledge. The total out of 25 will be reworked to a point out of 20. Different tests will then be the total for the preparation.

2. PREPARATION

Judging of the preparation will be done on the individual products being made. At the end of the preparation the average of the different score sheets will be calculated and this will then be the total for the preparation.

THE FOLLOWING WILL BE ALLOWED IN THE PREPARATION ROOM

- * All apparatus required to produce the products required for the different judging, this includes everything mentioned in the recipes for small scale production
- * A recipe with the basic ingredients + method of manufacturing the product will be accepted

THE SCORE SHEET FOR THE PREPARATION WILL CONSIST OF THE FOLLOWING SUBDIVISIONS:

Preparation	(10)
Hygiene	(15)
Apparatus	(10)
Process	(15)
Total:	[50]

3. TASTING

Judging of the tasting will be done “confidentially”. This means that an independent person will overlook the drawing of individual numbers for the tasting and see that the products are placed on the correct places according to the numbers for the tasting. The judges, or independent tasters can taste the product without being bias about who made the product.

Innovation of the “other” flavour produced for yoghurt and drink yoghurt will count in favour of the entrant, as it will give their product more individuality. Something different that is appealing will naturally score higher than something common.

THE SCORE SHEET FOR TASTING WILL CONSIST OF THE FOLLOWING SUBDIVISIONS:

Appearance of colour	(2)
Body & texture	(7)
Flavour & aroma	(11)
Total:	[20]

4. PRESENTATION

The total for the presentation of the products produced will be a total of 10 points. The mark will include originality of display and also the incorporation of the theme chosen for the year.

A table will be available, the rest you have to provide yourself.

1. PREPARATION

Make sure that you bring the equipment that is required. Utensils and apparatus cannot be shared. Each contestant is responsible for their own equipment.

2. HIGIENE

Wooden spoons are unacceptable, as they are very unhygienic. Rather use stainless steel or plastic ladles as they are more hygienic, wooden spoons are a breeding place for bacteria.

Use two dilutions for utensils that are being used frequently. The first dilution is jik or milton dilution, and is used to let the utensils stand in when not in use. Once you want to use a utensil, rinse it in hot water (boiled water) dilution and then place it in the product. When you are finished with the product, rinse it under running water and place it directly into the jik/milton dilution.

CLOTHING MUST CONSIST OF THE FOLLOWING

Long denim pants and T-shirt (sponsored)
Closed white takkies
Headdress (sponsored or cap of hairnet)
Apron - white (laboratory/ chef jacket is also acceptable)

3. APPARATUS/UTENSILS

It is advisable to use a double cooker. You use a small stainless steel pot inside a big aluminium pot filled with water. This will reduce the risk of burning the milk, and will give better control over keeping the temperature at 85-87°C.

Plastic dishes can be used for the washing of apparatus but glass bottles are preferred for the sterilisation and the continued cleaning of utensils in the production process.

Thermometers must not be kept in the pot whilst heating. It's detrimental for the thermometer to be exposed to heat all the time.

Rather use paper towels than material dish cloth after each use, this makes it a safer working condition and make sure that you know how all your equipment works.

4. PROCESS

Dry ingredients must not be weighed out before the time; this forms part of the examination.

All dry ingredients must be mixed dry and then mixed into the milk, except the culture, whilst the milk is still cold. If you pre-mix the dry ingredients it makes the dissolving of the dry ingredients into the milk so much easier. If there are lumps after you mixed in the dry ingredients, you can use a strainer to dissolve the lumps.

Make sure what the requirement is for pasteurisation. When using a stabiliser, make sure from the supplier what the preferred temperature and times are for the correct usage of the stabiliser.

Keep your recipes constant. Make sure that the correct dry ingredients go into the correct recipe.

Handwritten/Printed recipes must be used in the preparation room. A proposed recipe form part of the text book.

5. PRESENTATION

Is the presentation linked to the theme?

Did the entrant try to make the product look appealing in the display?

6. EXAMINATION

The test will be written on the same day and time as other show entrants.

The questionnaire will be done by the judge.

7. GENERAL

Bring along your lunch ticket and cutlery for the 2 days. Lunch will be served at the working place. Bring along something to drink. The kitchen is hot and the preparation takes time. The judge will provide the culture and fruit. A second taste of fruit may be provided by the participants.

11. PREFERRED SUPPLIERS

Animal Nutrition and Animal Products Institute Irene (LNR)
Private Bag X2
IRENE
0062

Tel: 012-67233/9297

Regal Fruits (Stephan Steyn)
Posbus 5283
KEMPTONPARK
1620

Tel: 011-9793887/8/9
Fax: 011-9794363
Cel: 076 139 1702