



## Food, Dairy and Home Economic Research

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### EFFECT OF MILK TYPE ON CAERPHILLY LIKE CHEESE QUALITY

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**ABSTRACT:** Caerphilly cheese is a British Welsh cheese originally processed from cow's milk and similar in its characteristics with Ras cheese, the most popular hard cheese variety in Egypt, which needs three to six months to sharp flavour. However Caerphilly cheese this period can be shorter than 3 weeks to reach the same organoleptic properties of Ras cheese. To process that variety under the Egyptian conditions, three types of milk processed into Caerphilly cheese as the following, 100% cow's milk, 100% buffalo's milk and mixture (cows: buffalos' 1:1). Resultant cheeses were chemically, physically, microbiologically and sensory evaluated at zero time and throughout the ripening period. Results indicated that, cow's milk gained higher quality cheese with low yield (12.91%) while, buffalo's milk gave harder and harsh cheese with higher yield (15.80%), as well as, mixture milk gained medium yield (13.01%) and the highest score of sensory properties (78/100) in fresh cheese and (88/100) after the 45 days of storage period compared with other treatments. Cheese made from buffalo's milk obtained the highest value for each of total solids, fat, ash and total protein when compared with other treatments either in fresh or after 15 days of ripening period. Cheese made from mixture milk had the lowest total counts of all types of cheese microflora either it was fresh or after 15 days of storage. Moreover, mixture milk cheese had the best rheological properties [Adhesiveness (g), Hardiness (N), Springiness (mm), Cohesiveness (Ratio), Gumminess (N), Chewiness (J) and Modulus (g/mm)] among cheese treatments. So, from these results it could be recommended to process Caerphilly cheese from mixture from cows and buffalo's milk to obtain the best characteristics and medium yield.

**Key words:** Caerphilly, cheese, cow's, buffalo's, mixture, ripening, physical properties.

### INTRODUCTION

There are over 700 named British cheeses produced in the UK. The regions of England have their own specialty cheeses, made by locals, with milk from local animals, reared on local pastures. The addition of famous herbs, honey and other locally-sourced goodies helps to define regional cheeses. According to the council regulation (EU) no 1151/ 2012 on protected geographical indications and protected designations of origin, Traditional Welsh Caerphilly/traditional Welsh Caerffili,, EC NO: PDO() PGI(x) Caerphilly, named after the Welsh town where it originated. Caerphilly - originally produced in the South Wales town of the same name, Caerphilly (fat/TS content range between 45% and 55%). It has a mild, salty,

buttermilk flavour, a crumbly texture and a pale creamy yellow colour. It is, roughly, halfway between a fresh cheese, like ricotta, and an aged cheese, like Cheddar. The universal process method of Caerphilly is curdling cow's milk (pasteurized or unpasteurized) with rennet, then cut, drained and placed in a flat cylindrical mold for a very light pressing. Caerphilly has a recipe similar to those for other crumbly cheeses – Cheshire and young Lancashire. Being close to the great mining towns of South Wales the young cheese was a firm favorite amongst mining communities as its shallow height and tough coat made it easy to eat with dirty hands down the mines, whilst its salty, moist curd helped to replace the minerals lost during the hours spent laboring under ground. Its more mature variant (often kept for up to a year)

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formed its own tough coat and gradually became harder in texture and stronger in taste with age. There are few traditionally shaped Caerphilly cheeses made today, and only one producer in South Wales. Most Caerphilly is made by the specialist crumbly cheese makers in Lancashire, Cheshire, generally in block form but sometimes in shallow wheels for supermarket pre-packs. This cheese tends to be young, fresh and clean tasting with a pleasant tang. The formed wheel (which is 10 in. diameter x 3 in. thick and weighs 7-9 lb) is then immersed in a brine bath for a day to facilitate the formation of a preservative rind, which is whitened by a dusting with rice flour. The cheese is aged for only about 10 days, in contrast to Cheddars, which are often aged for a year (**Stephan and Stephan, 2000**).

The cheese is typically made in a wheel, the rind is thin with a brushed mold coat. The interior texture is fairly close with a few mechanical openings (not due to gas) and cake-like due to the acidity. The body is semi-firm. The flavour is slightly acid and fresh when young (2 weeks-2 months); when more mature (3-4 months) the flavour is mild and smooth.

Ras cheese, the only hard Egyptian cheese needs more than 6 months to be well ripened and consumed. Possibly to be consumed after three months as pre-matured cheese (**Awad *et al.*, 2003**).

Ripening cost is very high for Ras cheese, as well as can reach to a nearly flavour for Ras cheese in Caerphilly cheese as shorter time with lowering these costs. The advantage of quickly ripening of Caerphilly like cheese will attract cheese processors to produce that variety of cheese. So, this work was aimed to produce Caerphilly- like cheese under the Egyptian condition from cow's and buffalo's milks and its mixture to present hard type cheese with the same common taste in Ras cheese (**Awad *et al.*, 2003**).

## MATERIALS AND METHODS

Fresh morning cow's and buffalo's milk were purchased from Faculty of Agriculture Mansoura University Dairy Unit. Local commercial animal liquid rennet was obtained from local market (40 mg/100 kg milk).

Traditional yoghurt starter contained *Streptococcus thermophiles* and *Lactobacillus delbrueckii* subs *bulgaricus* was purchased from Ch. Hansen, Denmark. Commercial food grade salt (El-Nasr saline's, Egypt) was obtained from the local market. Food grade calcium chloride was obtained from El-Gomhouria Company.

### Caerphilly Cheese Manufacture

Caerphilly cheese was made according to **Daive (1994)** with some modifications in the type of milk (cow's milk, buffalo's milk and their mixture Fig. 1).

Samples of fresh milk and whey were analyzed for TS, Fat, TN, lactose ash, acidity and pH values. Samples of the examined cheese were tested at intervals periods (fresh, 7, 14, and 45 days, and subjected to chemical, physical and microbiological analysis. Sensory evaluation was also carried out. Yield of the different cheese treatments was calculated when fresh and after 14 days of cheese making.

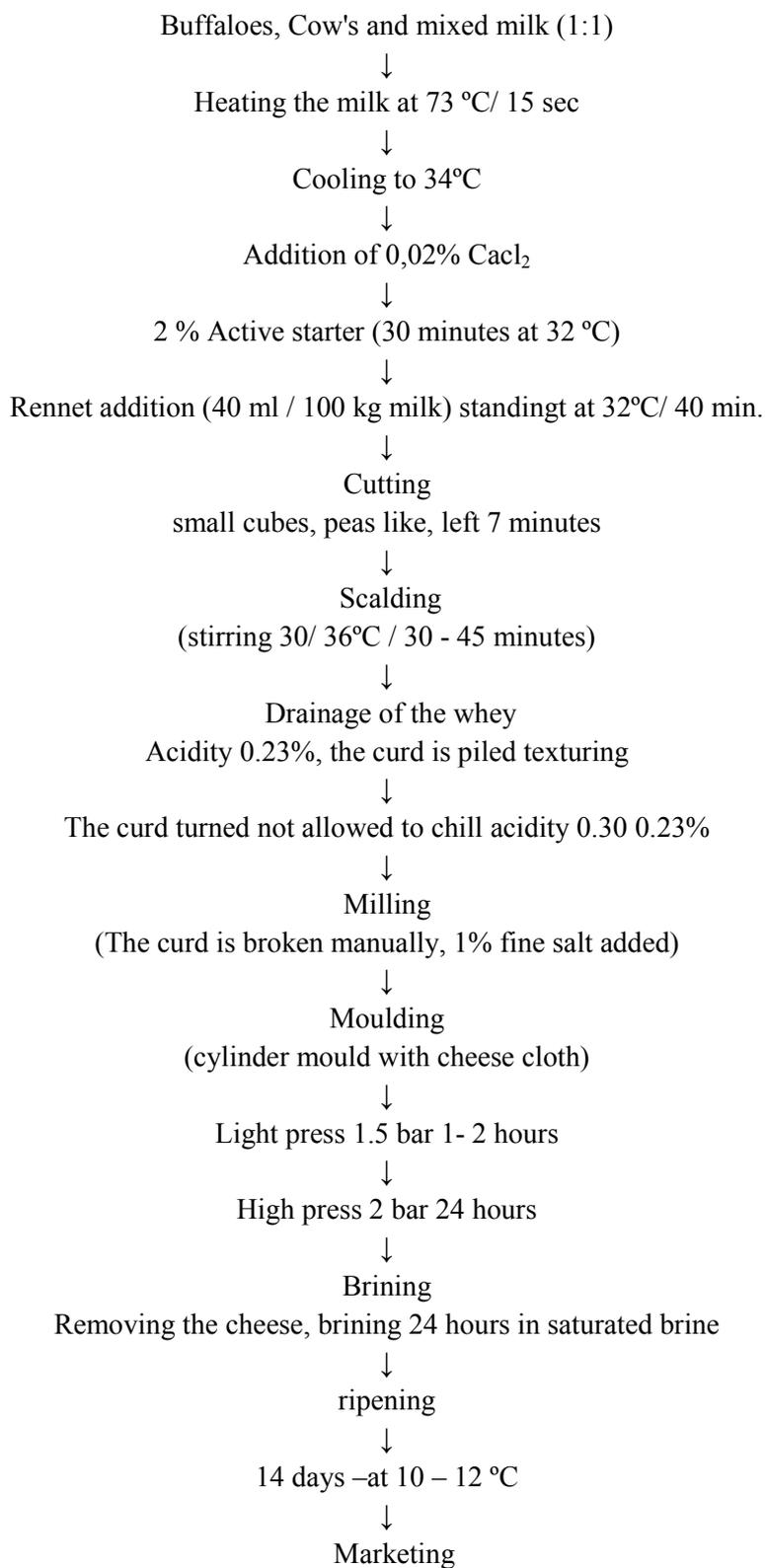
Moisture content of cheese treatments, pH values, and the fat content were determined using methods described in **AOAC (2000)**. Acidity, the total nitrogen and the ash content of investigated cheese were estimated according to the method described by **Ling (1963)**. Salt content was estimated according to **Kosikowski (1970)**.

Samples were analyzed at zero time and after 14 days of storage for Total lactic acid bacteria, moulds and yeasts count, according to **Standard Methods for the Examination of Dairy Products (1978)**.

Textural properties were determined according to **Szczesniak *et al.* (1963)** by using texture analyzer Lab pro (FTC TMS-pro, USA).

Samples from fresh and stored Caerphilly cheese were organoleptically evaluated according to the scheme described by **Nelson and Trout (1956)**. Cheese yield was calculated by **Metzger *et al.* (2000)** formula as follows:

Adjusted yield = (actual yield x (100- actual moisture + actual salt))/ (100- (55+1.5)).



**Fig. 1. Caerphilly-like Cheese processing flow chart**

## RESULTS AND DISCUSSION

Illustrated data in Table 1 show the chemical composition of the milk used for cheese making. Casein/Fat ratio was 0.453, 0.879 and 0.483 for buffalo's, cow's and mixed milk, respectively. The total protein content of standardized buffalo milk was higher (3.8%) than the mixture milk (3.2%). These results are in harmony with obtained results by **Abo-El Naga (1984)**.

### Acidity and pH of Resultant Cheese

Results of the pH values of the three cheese treatments decreased throughout the storage period (14 days). The acidity per cent was in an opposite relation with the determined pH values (5.6/5.2, 5.1/4.9 and 5.2/5.1) for, B,C and B+C mixtures of milk treatments, respectively. These results might be due to the increase in the microbial counts of the resultant cheese, and these differences might not be a result of the differences of the types or composition of milk used for making cheese treatment.

### Total Solids (TS%)

All treatment showed an increase of the total solids per cent after 14 days of storage due to the loss of some cheese moisture by the evaporation process on the refrigerated condition. Moreover, cheese made by buffalo milk gained the heights total solids (48.28/49.45%) per cent compared with the other treatment either in fresh or after 14 days of storage. This is might be due to the native composition of used milk and its high protein content.

### Fat and Fat/TS

Fresh cheese Fat content ranged among 22.38, 18.82 and 20.18%, with the highest content in the buffalo's cheese, while the lowest was in the cow's cheese, and this might be refers to the differences of the milk used in cheese making. In addition, the fat content markedly increased after 14 days and this might be as a result to the rise in the cheese total solids. There were slight differences in Fat/Ts values through the storage period, as they were (48.28/49.45), (43.38/44.92 and (46.34/46.84%) for B, C and B + C mixture milk treatments, respectively combatable results obtained by **Stephan *at el.* (2000)**.

### Total Protein (TP) and (TP)/(TS) Per cent

After 14 days of storage total protein were increased in all treatments, owing to the increase in total solids of resultant cheese. TP/TS of the fresh and 14 days ripened cheese were (39.72/39.88%), (32.32/34.01%) and (35.51/35.51%) for B, C and B+C mixture milk treatments respectively. This came in agreement with **Michele *et al.* (2019)**.

### Total Protein and Soluble Nitrogen

For all cheese treatments soluble nitrogen increased after 14 days of storage since the starter contained a high number of mesophilic bacteria, as it is obvious from the results mentioned in Table 2. It is clear that the buffalo's milk cheese have the highest SN content as a relation to the increase of the cheese microflora, compared with the other cheese treatments. As an indicator for ripening index SN/TP was evaluated. Values of SN/TP were (4.35/6.25), 10.91/12.50) and (6.86/8.56%) for fresh and after 14 days for B, C and B+C mixture milk, respectively. So, the using of cow's milk is recommended when the target is the higher ripening those. These results are in agreement with that reported by **El-Tahra *et al.* (2014)**.

### Salt and Ash Content

Results Illustrated in Table 2 show that there were slight differences of the salt content followed by ash content among all cheese treatments at the beginning of storage period, and the buffalo's milk cheese had the highest content. Also, these results reveal that there were a progress in the salt content throughout the storage, and that might be as a result to the rise in all stored cheese treatments total solids. These results agree with **Michele *et al.* (2019)**.

### Effect of Milk Type on Caerphilly Cheese Yield

Table 3 deals with the yield of Caerphilly cheese in a correlation with the type of milk used in the processing. The yield of the three treatments are calculated after 6 hours of lifting the cylinder cheese from brined solution, and the yield was estimated after 14 days of storage at 12±2°C. As it is expected the highest yield was

**Table 1. Gross chemical composition of different milks**

Type of milk	Fat (%)	TS	F/TS (%)	Protein (%)	Protein /Fat ratio	Ash(%)
Buffalo,s milk (B)	6.8	16.5	41.2	3.8	0.453	1.1
Cow's milk (C)	3.4	11.7	30.7	2.9	0.879	0.92
B + C (1: 1)	5.3	14.1	37.6	3.2	0483	0.98

**Table 2. Effect of milk type on the gross chemical composition of Caerphilly type Cheese**

Type of milk	Storage period	pH	TS (%)	Fat (%)	F/TS (%)	TP (%)	TP/TS (%)	SN (%)	SN/TS (%)	Salt (%)	Salt/TS (%)	Ash (%)
Buffalo	Fresh	5.6	48.28	22.38	48.28	18.41	39.72	0.80	4.35	2.16	4.66	5.08
	14 days	5.2	48.45	24.81	49.45	20.01	39.88	1.25	6.25	3.61	7.20	5.94
Cow	Fresh	5.1	43.38	18.82	43.38	14.02	32.32	1.53	10.91	1.94	4.48	4.16
	14 days	4.9	44.92	20.91	44.92	15.83	34.01	1.98	12.50	2.43	5.22	5.02
B+C (1: 1)	Fresh	5.2	46.34	20.18	46.34	15.64	35.51	1.06	6.86	2.01	3.52	4.89
	14 days	5.1	46.84	30.22	46.84	16.93	35.51	1.45	8.56	3.52	4.62	5.39

**Table 3. Effect of milk type on yield of Caerphilly cheese during storage period**

Treatment	B	C	B + C (1:1)
Yield of fresh cheese	16.52	13.86	14.81
Yield of ripened cheese (14 days)	13.95	10.55	11.93
Losses of weight	2.57	3.31	2.88

detected in the buffalos milk cheese since it has the highest total solids, casein and fat. The lowest of 3.31% was detected in cow's milk cheese, mixing buffalos milk with cow's milk raised the yield to 14.81%. After 14 days of ripening at storage conditions the yield decreased for the three types of cheese to reach 13.95, 10.55 and 11.93% for B, C and mixed cheese treatments, respectively. Caerphilly cheese processes from buffalo's or mixture milk were of higher yield and lower losses in yield during storage (El-Metwally, 2013). The addition of buffalo milk to cow's milk decreased losses in weight of cheese.

### Effect of Milk Type on the Gross Chemical Composition of Strained Whey

Table 4 illustrates the gross chemical composition of strained whey. Whey of buffalo's milk TS was higher than that of cow's or mixture milk because TS of buffalo's milk is higher in TS, Fat loses was the highest because of the higher percentage of fat content of buffalo's milk and also for the larger fat globules of buffalo's milk fat than cow's milk fat globules. Acidity values is higher in cow's milk whey since starter was more active in cow's milk than buffalo's milk owing to the higher buffer capacity of buffalo's milk than cow's milk,

**Table 4. Chemical composition of type cheese whey**

Type of whey	pH	Acidity (%)	TS (%)	Fat (%)	F/TS (%)	Protein (%)	P/TS (%)	Ash (%)
Buffalo's	5.8	0.30	6.1	1.2	19.67	1.02	16.72	0.48
Cow's	5.5	0.39	5.3	0.44	8.00	0.68	12.63	0.33
B + C ( 1:1)	5.7	0.36	5.7	0.9	15.79	0.74	12.98	0.39

mixed milk values were of intermediate value between cow's and buffalo's milk whey. **El-Metwally (2013)** found that total solids (TS) of buffalo's milk whey treatment has the highest of 6.1% among all milk treatments, which is due to the higher total solid in buffalo's milk. The lowest TS (5.3%) was for cow's milk treatment. Values of fat in whey ranged between 0.44 and 1.2%. The highest fat content was for buffalo's milk treatment. It is well known that buffalo milk fat globules are of the largest size. On the other hand, the highest fat content of buffalo milk helped the escape of higher percent of fat into the whey. Losses of whey protein ranged between 1.02 and 0.74%. The highest (1.02) was for buffalo milk, which contains the highest protein percentage among other milks. The lowest (0.68%) was for cow's milk treatment. Similar results were obtained by **El-Zoghby (1994)** and **Zaky (2014)**.

### Effect of Milk Type on Microbiological Properties

Results in Table 5 show the total microbial counts on the nutrient agar, Lactic acid bacteria agar, Mac Conkey and potato dextrose Agar (PDA). Heat treatment of milk led to high reduction of total microbial count, the colonies appeared on lactic acid bacteria and nutrient agar representing mainly the number of added mesophilic starter. From the results in the same Table, enumeration of either total count or lactic acid bacteria was higher in cheese of cow's milk, followed by mixed milk and the lowest enumeration was in buffalo's milk cheese. It is well known that starter culture is more active in cow's milk than buffalo's milk since buffalo's milk had higher buffer capacity and higher fat content, which slow the propagation of bacteria. Also, this higher number of lactic acid bacteria is highly responsible for the ripening of Caerphilly type cheese, because the heat treatment

inactivates most of indigenous enzymes of milk. Very few colonies were enumerated on Mac Conkey agar being nil. Detected in fresh cheese and disappeared during storage. No found colonies were detected on potato dextrose agar in fresh cheese and few numbers were detected after 14 days which due to the recontamination from the storage room.

Results belonging the Textural Profile in fresh and old cheese are tabulated in Table 6 which shows the calculated rheological parameters of fresh and 45 days Caerphilly-like cheese.

### Hardness

The strength of cheeses which increased for the three cheese after 14 days of storage, always the buffalo's milk cheese had the highest values. Since the matrix formed from rigid casein contain higher calcium content and bigger casein micelles. The increase of Hardness values after 14 days is owing to the increase in total solids. Similar results were obtained by **Naema (2017)**.

### Adhesiveness

It is clear from Table 6 the increase of adhesiveness after 14 days of storage, also the highest values for buffalo's milk cheese, values were (32.98/83.41), (38.62/86.71) and (46.15 and 111.66) for B, C and B+C treatments, respectively. Similar results were obtained by **Zehern and Nusbaum (1992)**.

### Cohesiveness

Cohesiveness is the measure of foods internal bonds making up the body of the product values. Cohesiveness decreased slightly after 14 days of storage being (0.47/0.43), (0.62/0.33) and (0.53 and 0.46) for B, C and B+C treatments, respectively which came in harmony with **Awad et al. (2005)** and **Zaky (2014)**.

**Table 5. Effect of milk type on microbiological properties of Caerphilly Cheese during storage period**

Microbiological counts	Storage Period	Treatment		
		Buffalo 100%	Cow 100%	Mixed 1:1
Neutrient Agar T,C × 10 <sup>4</sup> cfu/g	Fresh	20.00	30.00	16.00
	14 days	22.00	35.00	15.00
L.A.B×10 <sup>4</sup> cfu/g	Fresh	17.00	26.00	11.00
	14 days	29.00	33.00	25.00
M*.Y× 10 <sup>2</sup> cfu/g	Fresh	ND	ND	ND
	14 days	7.00	9.00	8.00
Ecoli× 10 <sup>2</sup> cfu/g	Fresh	ND	ND	ND
	14 days	ND	ND	ND

**Table 6. Effect of milk type on textural profile of Caerphilly Cheese during storage period**

Parameter	Storage period (day)	Treatment		
		Buffalo 100%	Cow 100%	Mixed 1:1
Hardiness (N)	Fresh	412	398	434
	14 days	1403	1023	1099
Adhesiveness (g)	Fresh	32.98	38.62	49.15
	14 days	138.41	86.71	111.66
Springiness (mm)	Fresh	5.61	4.67	4.94
	14 days	5.56	4.34	4.39
Cohesiveness (Ratio)	Fresh	0.47	0.62	0.53
	14 days	0.43	0.33	0.46
Gumminess (N)	Fresh	193.64	238.8	230
	14 days	605.00	638.0	505
Chewiness (J)	Fresh	1286.32	1115.2	1136.26
	14 days	3489.15	1157.94	2163.22
Modulus (g/mm)	Fresh	24.15	21.27	23.18
	14 days	78.78	71.19	73.29

### Springiness

Springiness or elasticity's is defined as a rate at which a deformed material returns to its original shape on removal of the deforming force. From Table 6, slight increase in value of buffalo's springiness from 5.61 to 5.76 mm, followed by the decrease occurred in cow's and mixed milk cheese after 14 days of storage. These results are in agreement with those obtained by **Awed *et al.* (2005) and Helal (2006)**.

### Chewiness

Chewiness is the energy required to chew a solid food product to a state where it is ready for swallowing (**Szczesniak *et al.*, 1963; Bourne, 1978**). Table 6 shows the values of chewiness which markedly increased by the storage time. The highest values were for buffalo's milk fresh and stored cheese (1286.32/ 3489.15), the lowest was for cow's milk cheese (1115.2/ 1157.94) these results agree with **Zaky (2014)**.

### Modulus

Measured in g/mm values rise as the storage period increased, the highest values were for buffalo's cheese followed by mixed milk the lowest value was for cow's 'milk cheese (24.15/ 78.78), (23.18/73.29) and (21.27/71.19).

### Organoleptic Properties of Careipghily Like Cheese

The opinions of the ten judges are summarized as shown in Table 7. The evaluating continued up to 45 days because some people like cheese with sharp peppery flavour for the all treatments as the storage period advanced the body and texture gradually improved since protein hydrolysis continued under the addition of enzymes secreted by lactic acid bacteria, cow's milk cheese had higher scoring points because the casein matrix is not firmer and rigid as casein matrix of buffalo's milk cheese. The coarse texture of buffalo's milk cheese was not highly accepted by the 10 judges. It is well known that buffalo's milk did not give accepted hard cheese, the cheese is always very hard and harsh. Mixing 50% cow's milk with 50%

buffalo's milk highly improved the body and texture of mixture milk Caerphilly cheese, the feeling of little hardness admired most of judges where the body and texture gained higher scoring points even over the evaluation of cow's milk cheese body and texture. Scoring points were donated for flavours, although buffalo's milk cheese had the highest amount of fat protein and ash, the flavour was not pronounced like what detected in cow's milk cheese. Flavour of mixed milk cheese was highly accepted and gained more scoring points, the rich fat flavour was attractive as well the ripening flavour was easily detected, the intensive yellow colour of cow's milk with the marked softness of the body and texture make the judger more happier with the body and texture of hard cheese of mixed milk cheese. At the end of ripning, total scoring points were 81/100, 82/100 and 88/100 for B,C and mixture milk cheese, respectively. These results are in agreement with **Zaky (2014)** who found that appearance of all Caerphilly cheese slightly decreased as the storage time advanced, while texture and flavour markedly increased as a result of storage. Flavour of cow's milk gained 29, 31 and 33 out of 35 for fresh and stored cheese, while buffalo milk cheese gained 18, 21, 22 and 24 points, respectively. The addition of cow's milk to buffalo milk improved the flavour 32,33,35 and 37 points for fresh and 45 days old cheese and obtained the highest total score points compared with other treatment. Total scoring points were (68/81), (72/82) and (78/88) point out of 100 for fresh and 45days old cheese for cow's, buffalo and mixed milk, respectively. These results are in harmony with **El-Zoghby (1994), Mostafa *et al.* (1996) and Sameen *et al.* (2008)**.

### Conclusion

Cheese producers always search for yield to make more profit while consumers search for acceptable hard cheese possibly to be sliced for the children sandwiches and accepted by different ages. So, preferable to manufacture Caerphilly like cheese from mixed milk B + C (1:1) to satisfy both producers and consumers.

**Table 7. Effect of milk type on the organoleptic properties of Caerphilly cheese during storage at 5-7°C**

Type of milk	Storage period (day)	Treatment		
		Buffalo 100%	Cow 100%	Mixed B+ C 1:1
<b>Appearance (30)</b>	<b>Fresh</b>	22	21	26
	<b>14 days</b>	23	22	25
	<b>30 days</b>	25	21	25
	<b>45 days</b>	24	21	27
<b>Body and Texture (30)</b>	<b>Fresh</b>	18	22	20
	<b>14 days</b>	21	23	22
	<b>30 days</b>	22	25	23
	<b>45 days</b>	24	26	24
<b>Flavour (40)</b>	<b>Fresh</b>	28	29	32
	<b>14 days</b>	29	31	33
	<b>30 days</b>	31	33	35
	<b>45 days</b>	33	35	37
<b>Total (100)</b>	<b>Fresh</b>	68	72	78
	<b>14 days</b>	73	76	80
	<b>30 days</b>	78	79	83
	<b>45 days</b>	81	82	88

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## تأثير اختلاف نوع اللبن على جودة شبيهه جبن الكيرفيلي

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يصنع جبن الكيرفيلي في ويلز في بريطانيا من اللبن البقري الخام فقط وله نفس خواص الجبن الراس المنتشر في السوق المصري والذي يحتاج إلى حوالي ٦ أشهر حتي تتم تسويته ولكن جبن الكيرفيلي يحتاج إلى أقل من ثلاثة أسابيع حتى يصل إلى نفس الطعم والخواص الحسية للجبن الراس، في هذا البحث تم تصنيع جبن الكيرفيلي تحت الظروف المصرية مع دراسة تأثير اختلاف نوع اللبن (بقري- جاموسي وخليط بقري إلى جاموسي بنسبة (١:١) على خواص الجبن سواء الكيميائية أو الحسية والمكروبيولوجية والريولوجية، وبينت النتائج أن الجبن المصنع من اللبن البقري فقط حصلت علي أقل نسبة تصافي بينما الجبن المصنع من اللبن الجاموسي حصلت علي أعلى نسبة للتصافي بينما الجبن المصنع من لبن خليط كانت نسبة التصافي وسط بين الجبن الناتج من اللبن الجاموسي والبقري، وحصل الجبن المصنع من لبن خليط علي اعلي درجات للتقييم الحسي سواء في حالة الجبن الطازج أو بعد التخزين لمدة ٤٥ يوماً، حصل الجبن المصنع من اللبن الجاموسي علي قيم اعلي للخواص الكيميائية مقارنة بالجبن المصنع من اللبن البقري أو الخليط سواء في حالة الجبن الطازج أو في نهاية التخزين، حصل الجبن الناتج من اللبن الخليط علي اعلي درجات للخواص الريولوجية (الصلابة - التماسك- المرونة- الالتصاق- اللزوجة- معدل المضغ- المعامل) مقارنة بالمعاملات الأخرى، لذلك من هذه النتائج نوصي بصناعة جبن الكيرفيلي من لبن خليط (بقري : جاموسي بنسبة ١:١).

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