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# Myth Busting Milk Banking

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*Gillian Weaver throws some facts at the misconceptions that abound*

**There are so many myths surrounding milk banking, donation and use of donor breastmilk that it seems time to address some of them.**

First the big one – milk banks all closed in the 1980s I keep thinking that this one has been scotched for good and then along comes someone who tells me that milk banks closed several decades ago. So, for anyone who is under this misapprehension – milk banks are alive and thriving and growing in both activity and number throughout the world. There are 17 milk banks in the UK, almost 200 in Europe, well over 200 in South America and new milk banks have recently been established in New Zealand and China as well as new banks to add to the numbers in Italy, Poland and India. There are milk banks in several African countries and, although this is a relatively new development, the numbers are growing there too. For details of national associations see the UK Association of Milk Banks website www.ukamb.org.

## Myth 1 – Pasteurising breastmilk destroys all the good things in the milk

The temperature and time combination used for the special heat treatment applied to breastmilk in milk banks (62.5 degrees C for 30 minutes) certainly makes the milk less valuable than freshly expressed raw milk that has not been heat treated, but there are plenty of beneficial components left. Pasteurisation makes donated milk safer for feeding to a baby other than the donor's own, as it generally inactivates viruses and bacteria. This is especially important when feeding it to immunecompromised, preterm or sick infants. Live cells in breastmilk are destroyed when milk is frozen but pasteurising will also inactivate them. It will slightly reduce the main immunoglobulin (secretory IgA) and lysozyme but significantly reduce the lactoferrin. However, if you're looking for these in breastmilk substitutes (infant formulas), they're not present, making pasteurised breastmilk a much better source of them all[1]

Lysozyme should be less affected by the heat treatment, leaving much of this very valuable anti-infective component of breastmilk intact and functional. Finally the lipase in breastmilk that aids fat digestion is completely inactivated and this means that heat-treated milk is less able to deliver all the calories that are contained in the fats because some may not be fully digested. But again, there's no lipase in formula either. The oligosaccharides that act as important prebiotics remain intact, as does most of the readily bio-available nutrition. The extent of the reduction in valuable immune-boosting properties in breastmilk will, in part, depend on how much is there to begin with and this varies but it is also influenced by the pasteurisation method. The main factors will be how accurately the temperature is maintained and how

quickly the milk can be heated to the correct temperature and cooled down again after the 30 minutes has elapsed.

New methods of pathogen reduction in breastmilk that will better protect the immunological components are being developed around the world but for now the equipment used provides a product that, according to WHO, is the next best thing to raw breastmilk.

## Myth 2 – Babies won't grow on pasteurised milk

Term babies grow perfectly well on pasteurised breastmilk and the experience of milk banks in North America, where they have provided donor milk to term babies for several decades now, has consistently shown this. Preterm babies may not initially gain weight as fast as they would if fed with a specialised infant formula but many neonatologists now question the desirability of premature babies growing too fast, especially if the weight gain is due to fat and not lean body mass2 Because it is easily and well digested and absorbed, total volumes of pasteurised breastmilk can be increased to greater amounts than with formula and so, if necessary, it is possible to deliver extra calories and protein from pasteurised donor milk by giving a bigger feed volume.

Additional nutrients such as iron and vitamins can be added and the breastmilk can still be supplemented with protein and calcium-based fortifiers. Additionally, and very importantly, preterm babies are more likely to develop necrotising enterocolitis if fed with infant formula and babies with this potentially fatal disease become too ill to grow well. If as a result of this condition they need to have a section of their gut surgically removed, this is likely to affect their later growth too.

## Myth 3 – You can't donate milk if there isn't a milk bank close by

This was true for a while in the UK, but since the widespread involvement of volunteer couriers provided by Blood Bike groups (see Nationwide Association of Blood Bikes website www.bloodbikes.org.uk), this is no longer the case for much of the UK. Having said that, the islands of Great Britain still present a problem and it is unlikely that milk banks will currently be able to recruit mums from Scottish Islands, the Scilly Isles or the Channel Islands without an offer to deliver the milk to the mainland by the donor or family. Islands aside, much of the UK is now covered by the Blood Bikes, who not only give their time but also pay for their own petrol and other bike costs. The areas in which they operate are growing and so, although there are still some exceptions, mothers can donate over much longer distances than they once could as long as the milk banks have a need for the milk.

## Myth 4 – If your baby is close to six months old, milk banks won't want your milk

The guidelines for milk banks that were published by the National Institute for Health and Clinical Excellence (NICE) in 2010 recommend that milk banks determine the criteria for accepting donations of milk according to their local requirements. Many milk banks will recruit mothers as long as their babies are less than six months old but will then support them to continue donating until their baby is between

nine months and one year. There are good reasons for limiting the time for donation if milk banks are mainly supplying donor milk to premature babies as the changes that take place in breastmilk over time can make it less able to support healthy growth in preterms, especially if they need donor milk for a prolonged period. However, the main reasons why banks prefer to recruit mothers with younger babies is because of the economics of milk banking. Donor recruitment is expensive and mothers with younger babies tend to donate more milk over a longer period, which helps to stretch the limited budgets that most banks rely on to keep operating.

## Myth 5 – Milk banks give breastmilk to formula companies for research

I am not aware of any milk bank in the UK supporting research by the formula industry by providing them with breastmilk. What may happen is that if a hospital-based clinical trial is being undertaken that is evaluating different methods of feeding babies – for example, using different supplements or fortifiers – milk banks may be supplying any donor milk that is being used by the hospital.

## Myth 6 – You have to donate large volumes of breastmilk to be considered as a suitable donor

The motto of UKAMB is 'Every Drop Counts' and the charity even has a specially recorded song by West London singer-songwriter Sedleigh that ensures this message is heard whenever and wherever it can be. Once mothers are recruited, their breastmilk will be valued, treated with great care and everything done to ensure it is used wherever possible. Unfortunately it isn't economically viable for milk banks to do all the expensive recruitment screening and blood tests if a mum is only going to be donating small amounts of milk. Some milk banks ask donors to commit to providing a minimum volume, but it is usually an amount that can easily be achieved by expressing regularly and donating for at least a month.

## Myth 7 – There's always a shortage of donors in the UK

Milk banks always need to recruit new donors because mothers who have been donating stop. Sometimes they stop because they are stopping breastfeeding altogether, sometimes because they are returning to work or are just getting too busy as their baby gets older and sometimes because they have reached the end point at which the milk bank will accept their breastmilk. However, currently few milk banks are experiencing a shortage of new donors wanting to be recruited and so take the place of those who are stopping. This is in part because of increased media interest in and publicity about milk banking, in part because of the great work of UKAMB in promoting the fact that mothers can donate some of their milk, but also because mothers who have donated tell their family and friends and so the message spreads.

I would encourage any breastfeeding mother to check the UKAMB website to see if she is eligible to donate and then contact UKAMB or her nearest milk bank to find out the next step. However, whilst new donors are always needed, there is a preference amongst milk banks for mothers with younger babies (preferably starting before the baby is three months old) and if the milk bank is well stocked with milk,

you may be turned away if your baby is six months old or if you are only going to be able to donate for a short period of time.

Milk banks all vary so it is best to check but advisors at UKAMB can help. So, whilst there isn't currently a national shortage of donors, milk banks always need new ones. Also as demand from neonatal units rises, which it is doing, more donors will be needed to meet the increased need so always check to be sure.

## Myth 8 – You can collect milk for milk banks that drips from one breast whilst your baby feeds at the other

So called 'drip milk' used to be banked by milk banks and, whilst it contains many of the useful immunological and protective components of breastmilk, it is very low in energy (calories) because it has a very low fat content. Most of the babies who receive donor milk have been born prematurely and it is important that they grow optimally so that their lungs are better able to work and their other organs develop and mature. Fats are essential for brain development and breastmilk contains the essential fatty acids needed by babies. In addition, the fat in breastmilk helps to ensure that the protein content isn't used up to provide energy but is available instead for the growth of muscles and lean tissue and to make enzymes and support other essential systems in the body. For this reason milk banks ask mothers to express their milk and to empty the breast that is being expressed completely and so collect the fat-rich hind milk.

## Myth 9 – You can't donate breastmilk in England, Scotland or Wales if you've had a blood transfusion

Everyone who believes this can be forgiven, as this is something that is currently in the process of being changed. In Northern Ireland the exclusion will continue. What is true is that you may not be able to donate milk if you have recently had a blood transfusion (in the past three to six months). This is because the milk bank will have to wait sufficient time to ensure that you haven't acquired any infection from the blood you received. This would be a very rare occurrence but, because it can in theory happen, milk banks have to delay doing the blood tests. In some milk banks, donors who have been partially recruited via the general health screening can express and store milk for the milk bank which is then quarantined until after the blood tests can be done. If a mother has previously been turned away as a milk donor on these grounds and is still eligible or has had a subsequent baby and would like to donate, it is worth trying again. If in doubt, contact UKAMB for further advice. The reason for the change is due to new and better understandings of the spread of vCJD (variant Creutzfeldt-Jakob disease) and updated information and knowledge about the possible risks of transmission of the disease.

## Having scotched a few myths, here are some milk banking facts that may seem unbelievable but are actually true!

Breastmilk was flown from London to Cambridgeshire in the 1930s by the daughter of a local doctor. She

had her own plane and flew down to Hendon twice a day to collect the milk that was delivered there by motorcycle from the wards at Queen Charlotte's Hospital in West London. The milk was fed to the first set of quads in the UK to survive and as a result of these endeavours the first milk bank in the UK was established at Queen Charlotte's. It is now the world's longest continually operating milk bank.

**Breastmilk is able to kill cancer cells**

Dr Catharina Svanborg, working in Lund in Sweden, showed that alphalactalbumin, a component of breastmilk, causes apoptosis (cell death) under certain defined conditions.[3] The clinical application of this is under investigation. The component has been given the acronym HAMLET, which stands for human alphalactalbumin made lethal to tumours. HAMLET has also recently been shown to decrease the resistance of some bacteria to antibiotics and so its use may aid treatments against infection in the future.[4]

In Brazil, fire fighters collect breastmilk for milk banks Using specially provided vehicles the firemen and women visit mothers' homes and deliver their donated milk to the milk bank. If they are called to fight a fire or attend another emergency whilst out on a collection they suspend their journey. In the meantime the milk is kept cold in specially designed cool boxes.

**Breastmilk ice cream was on sale**

The Icecreamists, a Covent Garden based ice cream emporium, caused one almighty commotion with, on the one hand, people queuing to buy it and, on the other, health and safety officials seizing samples. The seizure was temporary because the mothers providing the milk had undergone blood tests and the milk was heat treated. If you have breastmilk to spare and wish to turn it into ice cream to feed to your toddler oryoung child you can easily find recipes on the internet. However be warned, selling it may land you in hot water!

Breastmilk has on rare occasions been used to help patients with Crohn's Disease and Ulcerative Colitis. The anti-inflammatory properties of breastmilk together with its other immunological benefits have led to its use in severe cases. Breastmilk has also had a number of other clinical applications in older children and adults, including as a means of treating post operative cancer patients whilst undergoing chemotherapy. The volumes required would currently make it impossible to universally treat even older children who could benefit from breastmilk and without clinical trials doctors are very reluctant to consider recommending its use.

**Breastmilk changes**

Changes happen within each feed, between feeds, throughout the day, from one week to the next, and this continues as a baby gets older. There is no such product as standard breastmilk and whilst artificial infant milks are made to a 'formula', and so will taste the same from one feed to the next, breastfed babies will start to get used to the infinite possibilities of dietary changes through food from their very first feed of colostrum. The variations that take place in breastmilk are an everyday sight in milk banks

where it is reflected in the milk's appearance.

**There is a Guinness World Record for breastmilk donation**

It is currently held by Alicia Richman of Texas who donated more than 86 gallons over a 10-month period. Alicia hopes to break her record when she has her next baby!

All astonishing but true!

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**References**

1. Ewaschuk JB, Ungers, Harvey S, O'Connor DL, Field CJ (2011) Effect of pasteurization on immune components of milk: implications for feeding preterm infants. Appl Physiol Nutr Metab. 2011 Apr ;36(2):175- 82. doi: 10.1139/h11-008
2. Quigley MA, Henderson G, Anthony MY, McGuire W (2007) Formula milk versus donor breastmilk for feeding preterm or low birth weight infants. Cochrane Database Syst Rev. 2007 Oct 17;(4):CD002971
3. Svanborg C, Agerstam H, Aronson A, Bjerkvig R, Düringer C, Fischer W, Gustafsson L, Hallgren O, Leijonhuvud I, Linse S, Mossberg AK, Nilsson H, Pettersson J, Svensson M (2003) HAMLET kills tumor cells by an apoptosis-like mechanism – cellular, molecular, and therapeutic aspects. Adv Cancer Res. 2003;88:1-29
4. Marks LR, Clementi EA, Hakansson AP (2012) The Human Milk Protein-Lipid Complex HAMLET Sensitizes Bacterial Pathogens to Traditional Antimicrobial Agents. PLoS ONE 7(8): e43514. doi:10.1371/journal.pone.0043514