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Anne Hagen Grøvslien and Morten Grønn

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Donor Milk Banking and Breastfeeding in Norway

Anne Hagen Grøvslien and Morten Grønn, MD, PhD

Abstract

Milk banks in Norway have a long tradition of using raw milk. This is a practice the authors hope to continue as they see it as the best choice until a child's own mothers' milk production is sufficient. Not only will the premature babies benefit from having milk from the bank, but if a mother, for any reason, can not supply her baby while it's in the hospital her baby should be offered milk from a bank. In Norway, with a high breastfeeding rate this can be done at many hospitals. *J Hum Lact.* 25(2):206-210

Keywords: breastfeeding, donor milk, milk banking, Norway, preterm infants

Norway has a population of 4.5 million and about 60 000 deliveries every year. There are 55 birthing units across the country, and many are small local ones. There are 21 neonatal intensive care units (NICUs), located in 19 counties, which care for preterm and sick newborns.

Between 1993 and 1996, 70% to 80% of all infants were born in Baby-Friendly hospitals. Today 90% of babies are born in a Baby-Friendly facility. The Baby-Friendly status for the hospitals was reassessed for the first time after 10 years in 2005. Now there is an annual registration that does not require a full reassessment but does require review of practices. Currently 67% of the 21 NICUs are also designated Baby-Friendly.

Breastfeeding Practices in Norway

Before and during the Second World War (1939-1945) almost every Norwegian child was breastfed. After the war the breastfeeding incidence decreased.¹ With increasing hospital deliveries, scheduled feeding, and more availability of formula, the numbers of breastfed babies decreased. In the 1960s only 20% of

mothers were still breastfeeding their babies 3 months after delivery. Formula feeding was recommended to mothers with breastfeeding problems.

By the early 1970s breastfeeding rates were increasing again. Figure 1 shows all breastfeeding, not exclusive breastfeeding. The interest in breastfeeding increased as better information and help became accessible, and, most important, new routines on the maternity wards made breastfeeding again possible for the mothers. Today, rooming-in, feeding soon after birth, and infant-led feeding, including at night, are practiced in all hospitals.

The latest national statistics² show 99% breastfeeding initiation and 44% exclusive breastfeeding at 4 months. However, by 6 months, although 80% of babies are still breastfeeding, only 7% are exclusively breastfed. At 12 months, 36% continue to breastfed along with complementary feeding.²

The Norwegian breastfeeding support organization Ammehjelpen deserves a great deal of credit for this change. This group continues to actively educate and help both health care workers and mothers and parents. One of the issues in Norway has been breastfeeding in public, which has generated much public debate. Today there is no problem with breastfeeding almost anywhere at any time. A mother might get an ugly glance once in a while, but restaurants, shopping centers, and even government offices allow breastfeeding without any discussion.

Maternity leave has increased gradually as the breastfeeding rate has increased. Today a mother can stay home for 12 months with 80% of her usual income or for 10 months with 100% income. Mothers also have the right to take time off to breastfeed when they go back to work.

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Anne Hagen Grøvslien is a breastfeeding consultant and since 1995 has managed the milk bank at the Department of Pediatrics, Rikshospitalet University Hospital, Norway. Morten Grønn, MD, PhD, is with the Department of Pediatrics, Neonatal Unit, Rikshospitalet University Hospital, Norway.

Address correspondence to Anne Grovslien, Department of Pediatrics, Rikshospitalet University Hospital, 0027 Oslo, Norway; e-mail: anne.hagen.grovslien@rikshospitalet.no.

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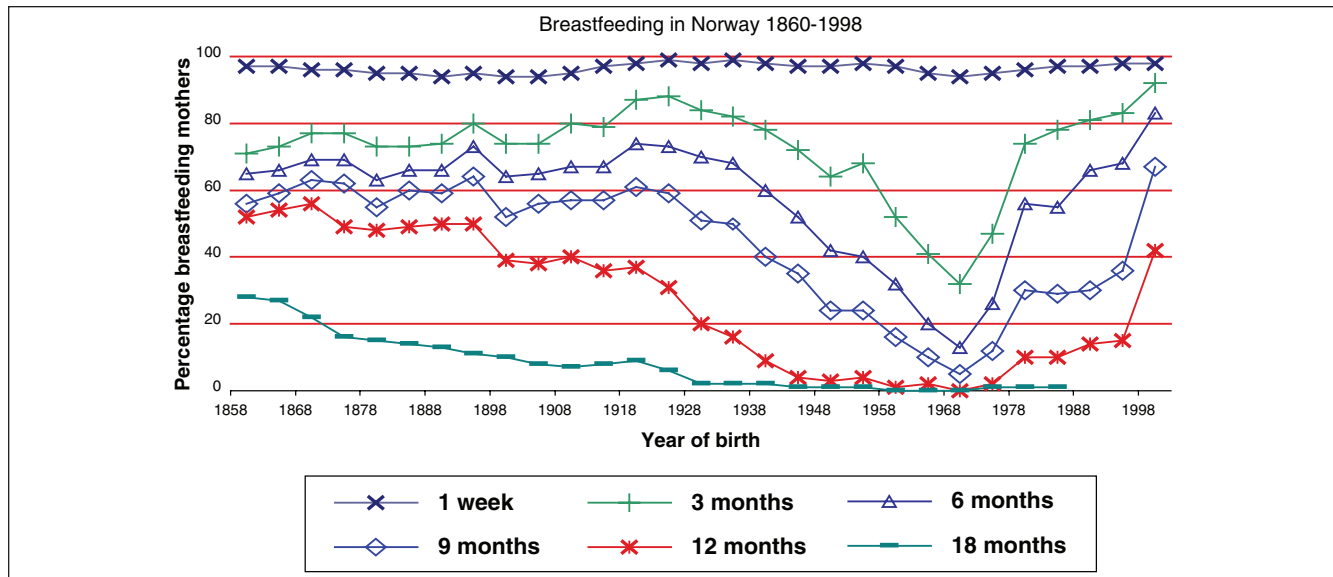


Figure 1. Breastfeeding in Norway 1860 to 1998. The graph is based on data collected and interpreted by Dr Margit Rosenberg in 1991, in connection with her doctoral thesis: Rosenberg M. *On the Relation Between Living Conditions and Variables Linked to Reproduction in Norway 1860-1984* [doctoral dissertation]. Oslo, Norway: Department of Informatics, University of Oslo; 1991. The data series was originally published in: Liestøl K, Rosenberg M, Walløe L. Breast-feeding practice in Norway 1860-1984. *J Biosoc Sci.* 1988;20:45-58. The data series was later adjusted by Dr Elisabet Helsing in collaboration with the author in order to add more recent comparable data from the period after 1984.³

Norwegian national guidelines for infant feeding published in 2001⁴ state that babies should be fed only with human milk for the first 6 months. Breastfeeding should continue for the whole first year, and solid foods are introduced gradually after the first 6 months of life. The regulations specify that if breast milk is not available in the first year, the baby should be fed infant formula. The guidelines also state that a few babies will need to start solid food earlier than 6 months but never earlier than 4 months.

Donor Milk Banks

Milk banking in Norway has a long tradition of using raw milk. It requires a strict control and screening of donors. A high breastfeeding rate affects the amount of milk available in the milk banks, and all the preterm babies are offered donor milk if the mother's own milk is not available or the supply is insufficient. We have a program of active and early nutrition support for preterm infants to avoid malnutrition.

There are still some differences among the Norwegian milk banks but in general they are operated similarly.

History of the Norwegian Donor Milk Banks

The first donor milk bank in Norway was opened by the Germans in 1941 during the Second World War. It

has moved a few times and is now located at Ullevål University Hospital in Oslo. Around 1990 the interest in donor milk banks increased, and in 1997 there were 17 active donor milk banks. Today there are 13 donor milk banks, all located in and operated by hospitals with level III NICUs.

Guidelines for the Milk Banks

In 2002 the Norwegian National Board of Health published guidelines⁵ for the operation of donor milk banks. The guidelines state that human milk is both biologically active tissue and nutritional support. The guidelines define the organizational structure of the milk banks, what equipment is to be used and how it must be maintained, donor qualifications and exclusion criteria, and procedures for screening, handling, and dispensing the milk. Donor milk banking in Norway is still based on the long tradition of using raw, unpasteurized milk for the premature infant. Only 1 milk bank in Norway pasteurizes all donor milk and uses the milk for preterm babies less than 1500 g. Norway continues to have a low incidence of necrotizing enterocolitis and late-onset sepsis.⁶

One issue that we are looking into is the risk of cytomegalovirus (CMV) transmission via milk for the extremely premature infant. At Rikshospitalet University

Hospital we are considering pasteurization to deactivate CMV in the milk for these infants. However, with larger and term babies there are so far no plans to change our practices.

The use of raw milk is reasonable in a country such as Norway with a very low incidence of HIV and hepatitis and a high standard of living, where donors can be retested frequently.⁷

All donors go through an extensive screening process to rule out any risk factors for disease and every third month are given a blood test for HIV, hepatitis B and C, CMV, and human T-cell leukemia virus (HTLV) 1 and 2. To date, there has not been a positive test result when retesting an approved donor at our hospital.

The criteria for becoming a donor can seem difficult, but we usually have no problem recruiting enough donors. Norwegians in general, and donors suitable for milk banks in particular, are not a high-risk group for any of these diseases; however, the issue of using raw donor milk is constantly under discussion.

All milk banks must have a system for tracing the milk from the donor to the recipient and from each recipient back to the donor, just like a blood bank. However, the anonymity of both the donor and the recipient is always maintained.

A few banks sell milk to other hospitals, but mostly they provide their own neonatal unit and in some cases other units within the hospital. Babies who are not hospitalized are not a prioritized group for receiving donor milk in Norway. However, there have been a few cases where milk was provided to a baby at home for a fee. For example, a baby with an HIV-positive mother and a baby with allergies whose mother had cancer were provided with donor milk after hospital discharge. They had all been treated at the hospital and the doctor asked whether we could provide them with milk for a few weeks. No prescription is required in such cases, but typically milk banks do not dispense milk to outpatients not treated by the hospital.

The 2002 national milk bank guidelines also state that parents should be informed of the option to use donor milk for their sick newborn babies. Information must include our excellent track record with using donor milk from healthy Norwegian women and the risk of using non-human milk alternatives.

Rikshospitalet Donor Milk Bank

Rikshospitalet University Hospital has about 2000 deliveries every year and a neonatal unit with 22 beds.



Figure 2. Milk ready for use.

The NICU is a regional referral center, and 20% of the premature babies in Norway (< 1500 g) spend their first weeks here. The hospital is located close to the capital center, Oslo, and in a densely populated area. At our hospital no milk is pasteurized. Each 500-mL container of milk from a donor is screened for bacteria. Milk that contains any pathogens or high bacterial count (> 100 000 colony-forming units/mL) of any other bacteria is destroyed. Milk with a low bacteria count (< 10 000 colony-forming units/mL) is used for the smallest preterm babies (Figures 2 and 3).

Rikshospitalet University Hospital has 40 to 60 donors each year, mostly recruited outside the hospital. Some donors have given more than 400 L of milk, but the average is 30 L. In recent years the total amount of milk collected at Rikshospitalet has been 1000 to 1100 L per year. The donors usually donate for 6 months and are offered use of a hospital-grade pump for free. The milk bank gives donors a small compensation of 150 NOK per liter, or about \$20 US per liter, to cover electricity and travel expenses such as parking and toll roads. Compensation for donors varies. Some milk

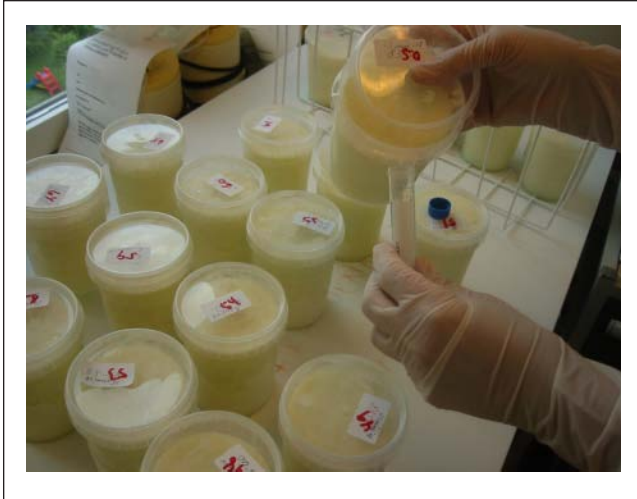


Figure 3. Testing the milk for bacteria.

banks do not compensate their donors. The national guidelines say that payment for the milk is not allowed but that the donor can be compensated for actual expenses she has incurred. There is a charge of 650 NOK, or \$100 US, per liter for milk dispensed to other hospitals.

At our hospital all babies who may need milk from the bank are offered it. Sometimes this is a healthy baby whose mother cannot breastfeed while she is in the hospital. We work closely with the NICU and the nutrition unit and give lactation support to the mothers of the NICU babies.

Guidelines for Nutritional Support in the NICU at Rikshospitalet

To avoid postnatal malnutrition, we have active and early nutrition support for all preterm infants. All babies who need parenteral nutrition will start with protein (2 g/kg/d) and lipid solution (0.5-1.0 g/kg/d) in the first days of life. Carbohydrate infusion is maintained at a minimum level of 8.5 g/kg/d. Insulin infusion is now more frequently used to regulate the blood sugar. Minimal enteral feeding with human milk, either from the mother or from the milk bank, is started on the first day of life. All babies who have an intact digestive system, regardless of gestational age or other malformations or diseases, will start enteral feeding with human milk (0.5-1.0 mL/kg/h). In some babies with severe asphyxia, the start and progression of enteral feeding will be slower. Human milk fortifier is added from day 7 if tolerated.

Late-Onset Septicemia of Extremely Premature Infants Receiving Very Early Full Human Milk Feeding

A prospective study was done by Rønnestad et al⁶ of all infants born in Norway in 1999 and 2000 at less than 28 weeks gestation or with a birth weight of less than 1000 g. Extensive clinical information, including data on feeding practices and episodes of septicemia, was collected. The study showed that very early enteral feeding with human milk, achieving 150 to 200 mL/kg/d by the second week of life, reduced the risk of late-onset septicemia by nearly 4-fold among these extremely premature infants. The overall most influential risk factor for late-onset septicemia was the number of days without establishment of full enteral feeding with human milk. The study also showed that very early feeding with human milk is possible at a much earlier age than commonly reported. Enteral feeding with human milk was initiated within the third day for 98% of patients, and 92% were receiving full enteral feeding with human milk by the third week. This is the current practice in Norway but is dependent on the availability of human milk from the mother or the milk bank.

Summary

Breastfeeding initiation in Norway is 99%, but for the babies who weigh less than 1500 g and whose mothers cannot supply milk, there is a network of donor milk banks that are part of the national health system. Milk banking in Norway goes back to 1941. All donors are carefully screened, and most milk is dispensed raw, rather than pasteurized.

For the future we hope to continue our long practice with using raw milk. Good guidelines and an active milk bank association will ensure that that every baby, no matter where he or she is born in Norway, is offered milk from the banks if needed and wanted. We can thank our breastfeeding mothers for a good supply of milk to the banks.

Acknowledgments

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