Milk banking: an idea that has come of age
Non-profit milk banks.

Presenter: Nicole J. Bernshaw, MSc, IBCLC

Utah Breastfeeding Coalition Meeting
Tuesday August 29, 2006, noon to 1 pm
Salt Lake City Main Library, Conference room C

A little bit of history

• the first formal milk bank in Vienna in 1909

1919: Boston, MA: 1st in NA: became a model for milk banks in other American cities: Chicago, New York, Los Angeles

Dionne quintuplets born in Québec in the '30s were fed almost 250 liters (8000 ounces) of donor milk

1939: first milk bank in the UK

1943: AAP Committee on Mothers' Milk published standards for milk bank operations (collection, processing, storage, dispensing)

UKAMB: United Kingdom Association for Milk Banking
Formally established in 1997
17 milk banks as of 2005
DEBM: donor expressed breast milk

Northern Ireland: highly effective system where every hospital with a neonatal unit is able to accept donations of milk for banking

Brazil: 90 milk banks in 1998, 186 in 2005

Milk banks are well established in India and China

HMBANA: Human Milk Banking Association of North America
Established in 1985
14 milk banks in 1985
5 member milk banks in 2001
11 in 2006 (including one in Canada and one in Mexico)

1980s: discovery of HIV, virus transmitted through milk
mandatory HIV testing
women reluctant to volunteer to be tested for HIV
dramatic drop in donation

• traditionally, milk banks have been not-for-profit/non-profit/charity

HMBANA

Goal when established in 1985: establish standards for all NA milk banks
HMBANA Guidelines
- Developed with the assistance of the FDA and AAP
- First published in JHL Dec'90
- Based on research findings
- Annual update reflects new technology

Definition of a Milk Bank for membership in HMBANA: "A Milk Bank is an organization that collects, pasteurizes and dispenses donor human milk according to guidelines established by the Human Milk Banking Association of North America."

Self-regulated: Despite repeated requests to FDA, HMBANA is self-regulated. FDA's reason: perfect safety record. Emergence of for-profit milk bank has them concerned and a number of HMBANA milk banks were recently visited to review the process and evaluate the need for regulation.

Main **sources of revenue**: grants and donations
- Distributes milk on a need basis, not on who can pay.

List of priority for recipient selection

1. Prematurity	1. lactation failure
2. Malabsorption	2. adoption
3. Feeding intolerance	3. mother's illness
4. Immunologic deficiencies	4. health risk from own
5. Congenital anomalies	mother's milk
6. Post-operative nutrition	5. death of the mother

Some milk banks have **satellites/depots**
- Example: Mothers' Milk Bank in Denver, CO
- Milk is collected and stored there until it is shipped to the milk bank for processing

Note:
Human milk is **not** designed to insure the survival of very premature babies that are born nowadays.
Therefore,
Human milk is **not** deficient.

Why use (pooled) banked milk?
- Earlier tolerance of enteral feeds => shorter hospital stay
- Short term: Reduced risks of infection and necrotizing enterocolitis (NEC)
- Long term: reduced risk of insulin resistance and short gut syndrome following NEC
- All associated with lower medical costs

Cost benefits hidden because of the protective nature of donor milk

Operation of a milk bank

Screening of potential donors
- Medical records, history of communicable diseases, diet
- Educational information (about characteristics of high risk groups or activities in transmission of blood-borne pathogens)
- Permanent exclusion
- Temporary disqualification
  - Not eligible (examples)
    - Recipient of blood transfusion, organ transplant, tattooing in the last 12 months
    - Ever received bovine insulin
    - Ever had hepatitis or jaundice after age 11
    - On regular medication (list)
    - Use tobacco products
  - May not be eligible (examples)
    - Has been told she cannot give blood for a medical reason
    - Has ever tested positive for tuberculosis
    - Consumes more than 24 ounces caffeinated drink per day
    - Breastfeeding a child older that 1 year

Serological testing
- HIV-1, HIV-2, Hepatitis B and C, HTLV-1 (human T-lymphotropic virus), syphilis (no more than 6 months prior to first donation), CMV, tuberculosis, herpes

Written instructions to donor on:
- hand hygiene
- handling and labeling of containers
- milk storage and transport

Milk processing
- Freezing
- Thawing/defrosting
- Pooling of fresh-raw milk
  - "Only milk from pools with <10e4 CFU/ml of normal skin flora (e. g., coagulase negative *staphylococcus*, *diptheroids, Staphylococcus epidermis,* or *Streptococcus viridans*) will be acceptable to dispense raw." These bacteria are normal inhabitants of human skin and mucous membranes.
- Pooling and aliquoting of frozen milk into containers for pasteurization
  - Pasteurization: the linchpin for safety
  - 62.5-63˚C for 30 minutes
  - Time consuming, not cost effective on the basis of individual use

Cooling
Testing for bacterial content
"Any bacteriological growth is unacceptable for heat processed milk"

Safety of informal milk sharing (or lack thereof)

- not screened nor tested according to milk banking protocols
- contains a different bacterial and viral flora, and different antibodies
- not nutritionally age-appropriate

- simply "knowing" the donor is not enough
- the donor may have some health condition that she is unwilling to share or of which she is not aware
- donor at risk for liability should anything wrong happen to the baby fed untested milk

References:

Guidelines for the Establishment and Operation of a Donor Human Milk Bank. HMBANA 2005.

Informal Sharing of Human Milk: Not-so-Hypothetical Questions, Concrete Answers. Lois DW Arnold. *Journal of Human Lactation* 10(1):43-44, 1994.

Feeding and Nutrition in the Preterm Infant. Elizabeth Jones and Caroline King, editors. Elsevier, Churchill, Livingtone, 2005.

Starting a Donor Human Milk Bank: A Practical Guide. Gretchen Flatau and Sarah Brady. HMBANA, 2006.

www.hmbana.org/

www.paho.org/english/dd/pin/ptoday19_sep05.htm (Brazil)

http://www.bestfedbabies.org/ (Mothers' Milk Bank, Denver, CO)