

## Strategy 1: Expressed human milk & KDT formula bottle

3.5 kg – Schedule 7x 70 ml, 150 ml/kg, 100 kcal/kg, 1.5-2 g prot./ kg							
Volume/%	90%	50%	25%	20%	15%	10%	5%
Human milk (g/total and ml / bottle)	440g/63 ml	245g/35ml	126g/18ml	98g/14ml	70g/10ml	49g/7ml	25g/4ml
Ketocal® 3:1 (g/total)	7	26	38	40	43	45	48
Water (ml/total)	46	230	345	370	400	420	440
<b>KDT - Ratio</b>	<b>0.6 : 1</b>	<b>1 : 1</b>	<b>1.6 : 1</b>	<b>1.8 : 1</b>	<b>2.1 : 1</b>	<b>2.3 : 1</b>	<b>2.5 : 1</b>

Prepare the total volume of bottles by mixing Ketocal® 3:1 with the total amount of water and divide this into 7 bottles. Add expressed human milk to every single bottle as mentioned below to make it 70ml /bottle

## Strategy 2: KDT formula bottle followed by breastfeeding

3.5 kg – Schedule 7x 70 ml, 150 ml/kg, 100 kcal/kg, 1.5-2 g prot./ kg							
Bottle first	7x 10 ml	7x 35 ml	7 x 50 ml	7x 55 ml	7x 60 ml	7x 63 ml	7x 65 ml
Ketocal® 3:1 (g/total)	7	26	38	40	43	45	48
Water (ml/total)	46	230	345	370	400	420	440
<b>Breastfeeding*</b>	~ 5-10 min.	~ 5-10 min.	~ 5-10 min.	~ 5-10 min.	~ 5-10 min.	~ 5-10 min.	~ 5-10 min.
<b>KDT-ratio</b>	<b>0.6 : 1</b>	<b>1 : 1</b>	<b>1.6 : 1</b>	<b>1.8 : 1</b>	<b>2.1 : 1</b>	<b>2.3 : 1</b>	<b>2.5 : 1</b>

Calculate minutes on an individual basis (weighing, level of ketosis).

Calculation used in the German-speaking countries for 100 ml (Standard solution- last row)						
KDT- Ratio	0.6 : 1	1 : 1	1.5 : 1	2 : 1	2.5 : 1	3 : 1
Ketocal® 3:1 (g)	1	5	7	8	9	9.3
Water (ml)	10	45	65	80	90	90
Volume- Ketocal® + Water (ml)	10	50	70	85	95	100
Human milk (ml)	90	50	30	15	7	0
Calories (kcal)	69	70	70	67	68	66
Protein (g)	1.2	1.3	1.4	1.4	1.4	1.4



### Background information

Ketogenic diet therapy (KDT) has been proven feasible, effective, and safe in infancy. Significant seizure reduction is more common when KDT is used early and for specific epilepsy syndromes and aetiologies. Recent data show that complete weaning from breastfeeding is not required when KDT begins, and that including human milk or breastfeeding is possible

**In practice:** Maintaining breastfeeding is limited by several barriers; feasibility concerns, lack of referrals and opportunities. Practical strategies are needed to help mothers and professionals to overcome these while on KDT to facilitate breastfeeding and human milk use.

**How:** The aim of this pocket guide is to provide information and practical recommendations to increase breastfeeding/ human milk use during KDT.

**These contain:** Current evidence based on a review of the literature, current clinical practice based on 2 international surveys, precisely calculated recommendations for two feeding strategies

# KETOGENIC DIET THERAPY, HUMAN MILK, AND BREASTFEEDING POCKET GUIDE

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## KEY POINTS

### Infants have a clear indication for KDT in epilepsy

- Physiological advantages of human milk
- Mothers want to breastfeed, despite distress
- Many centres recommend weaning human milk /breastfeeding while on KDT
- The composition of human milk can vary
- Ketosis in early infancy is sufficiently high
- Carbohydrates can be given as human milk by modifying the KDT ratio
- Adverse events are mostly transient

### Be aware of breastfeeding ketoacidosis in mothers

## Strategy 1: Expressed human milk and KDT formula

### PRO

- Fixed ratio for each meal
- Ketosis stable-easy to control
- Ad libitum and freezing possible

### CONTRA

- No breastfeeding
- Pain/ Discomfort from regular pumping
- Mothers want to breastfeed, despite distress

## Strategy 2: Allow breastfeeding after KDT formula

### PRO

- Breastfeeding is maintained
- Bonding/Interaction
- No pumping
- Breastfeeding sets can be used

### CONTRA

- Ratio unknown
- Ketosis may fluctuate
- Volume not flexible
- Different sucking techniques
- Different composition of foremilk - hindmilk

### How to do it

- Start with a low ratio: more human milk is possible
- Measure ketosis 1 hour after feed

### Strategy 1: Use expressed milk

- Express human milk
- Calculate expressed human milk into KDT (5-50% of volume feed)
- Mix expressed human milk and KDT formula

### Strategy 2: Allow Breastfeeding

- Start with KDT formula (130 -150ml/kg per day) followed by breastfeeding
- Monitor weight
- Count feeding minutes per breast side

## AIM:

## Inclusion of Human milk

### How to do it

Start with a low ratio  
**more human milk possible**  
Measure Ketosis after 1h

### EXPRESSED MILK

Express milk  
Calculate expressed human milk into KDT

### BREASTFEEDING

Start with KDT formula followed by breastfeeding  
Monitor weight  
Count feeding minutes per breast side