Diagnosis and Management of CMA

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Food allergy in children and young people
Implementing NICE guidance

February 2011

NICE clinical guideline 116
NICE expects primary care based HCPs to:

1. Assist in the diagnosis of food allergies
2. Perform appropriate food allergy tests when indicated
3. Manage delayed type (non-severe) food allergies without onwards referral
4. Perform food challenges to delayed type (non-severe) food allergies
5. All of the above
Know your nomenclature

So...in terms of cow’s milk...

A cow’s milk protein intolerance is:

1. An immune mediated reaction to cow’s milk
2. A non-immune mediated reaction to cow’s milk
3. There is no such thing as cow’s milk protein intolerance
Know your nomenclature

Immune system involved

Cow’s milk protein allergy

IgE mediated cow’s milk allergy e.g. urticaria

Non-IgE mediated food allergy e.g. diarrhoea and constipation

Food Hypersensitivity

Non-allergic FHS e.g. lactose intolerance

Does not involve immune system

▪ European Academy of Allergy and Clinical Immunology - EAACI
Clinical and Translational Allergy Journal – July, 2013

▪ British Medical Journal – September, 2013

▪ British Journal of General Practice – January, 2014

Adam Fox, Jo Walsh, Trevor Brown
Carina Venter, Neil Shah
COWS’ MILK ALLERGY IN CHILDREN
Suspected Cow’s Milk Allergy (CMA) in the 1st Year of Life - having taken an Allergy-focused Clinical History

**Mild to Moderate Non-IgE-mediated CMA ‘Delayed’ Onset Symptoms**
Mostly 2-72 hrs. after ingestion of CMP
Formula fed, exclusively breast fed or with onset of mixed feeding
One or more of these symptoms:

**Gastrointestinal**
‘Colic’
‘Reflux’ - GORD
Food refusal or aversion
Loose or frequent stools
Perianal redness
Constipation
Abdominal discomfort,
Blood and/or mucus in stools in an otherwise well infant

**Skin**
Pruritus, erythema
Significant atopic eczema

**Respiratory**
‘Catarrhal’ airway symptoms
(usually in combination with one or more of the above symptoms)

Can be managed in Primary Care
See Management Algorithm

**Severe Non-IgE-mediated CMA ‘Delayed’ Onset Symptoms**
Mostly 2-72 hrs. after ingestion of CMP
Formula fed, exclusively breast fed or at onset of mixed feeding
Severe persisting symptoms of one or more of:

**Gastrointestinal**
Diarrhoea, vomiting, abdominal pain, food refusal or food aversion, significant blood and/or mucus in stools, irregular or uncomfortable stools.
+/- Faltering growth

**Skin**
Severe Atopic Eczema +/- Faltering Growth

**Severe IgE CMA ANAPHYLAXIS**
Immediate reaction with severe respiratory and/or CVS signs and symptoms.
(Rarely a severe gastrointestinal presentation)

Emergency Treatment and Admission

Cow’s Milk Free Diet
Amino Acid Formula - AAF
Advise breast feeding mother to exclude all CMP from her own diet and to take daily Calcium (1000mg) and Vitamin D (10mcg) supplements

Ensure:
Urgent referral to a paediatrician with an interest in allergy
Urgent dietetic referral

Cow’s Milk Free Diet
Extensively Hydrolysed Formula - eHF
(Initial choice, but some infants may then need an Amino Acid Formula - AAF trial if not settling)
Advise breast feeding mother to exclude all CMP from her own diet and to take daily Calcium (1000mg) and Vit D (10mcg) supplements

If diagnosis confirmed (which may require a Supervised Challenge) – Follow-up with serial IgE testing and later planned and Supervised Challenge to test for acquired tolerance
Dietetic referral required
If competencies to arrange and interpret testing are not in place - early referral to a paediatrician with an interest in allergy - advised

**Mild to Moderate IgE-mediated CMA**

**Severe IgE-mediated CMA**

**‘Acute’ Onset Symptoms**
Mostly within minutes of ingestion of CMP
Mostly formula fed or at onset of mixed feeding
One or more of these symptoms:

**Skin**
Acute pruritus, erythema, urticaria, angioedema
Acute ‘flaring’ of atopic eczema

**Gastrointestinal**
Vomiting, diarrhoea, abdominal pain/colic

**Respiratory**
Acute rhinitis and/or conjunctivitis

Immediate reaction with severe respiratory and/or CVS signs and symptoms.
(Rarely a severe gastrointestinal presentation)

Emergency Treatment and Admission

Cow’s Milk Free Diet
Amino Acid Formula - AAF
Advise breast feeding mother to exclude all CMP from her own diet and to take daily Calcium (1000mg) and Vitamin D (10mcg) supplements

IgE testing needed.
If diagnosis confirmed (which may require a Supervised Challenge) – Follow-up with serial IgE testing and later planned and Supervised Challenge to test for acquired tolerance
Dietetic referral required
If competencies to arrange and interpret testing are not in place - early referral to a paediatrician with an interest in allergy - advised
Suspected Cow’s Milk Allergy (CMA) in the 1st Year of Life
- having taken an Allergy-focused Clinical History

Severe
Non-IgE-mediated CMA
‘Delayed’ Onset Symptoms
Mostly 2-72 hrs. after ingestion of CMP
Formula fed, exclusively breast fed or at onset of mixed feeding

Severe persisting symptoms of one or more of:

Gastrointestinal
Diarrhoea, vomiting, abdominal pain, food refusal or food aversion, significant blood and/or mucus in stools, irregular or uncomfortable stools.
+/- Faltering growth

Skin
Severe Atopic Eczema +/- Faltering Growth

Severe IgE CMA
ANAPHYLAXIS
Immediate reaction with severe respiratory and/or CVS signs and symptoms.
(Rarely a severe gastrointestinal presentation)

Mild to Moderate
IgE-mediated CMA
‘Acute’ Onset Symptoms
Mostly within minutes of ingestion of CMP
Mostly formula fed or at onset of mixed feeding

One or more of these symptoms:

Skin
Acute pruritus, erythema, urticaria, angioedema
Acute ‘flaring’ of atopic eczema

Gastrointestinal
Vomiting, diarrhoea, abdominal pain/colic

Respiratory
Acute rhinitis and/or conjunctivitis

Emergency Treatment and Admission

(TB/AF/NS/CV/JW May 2013)
Mild to Moderate Non-IgE-mediated CMA ‘Delayed’ Onset Symptoms

Mostly 2-72 hrs. after ingestion of CMP

Formula fed, exclusively breast fed or with onset of mixed feeding

One or more of these symptoms:

Gastrointestinal
‘Colic’
‘Reflux’ - GORD
Food refusal or aversion
Loose or frequent stools
Perianal redness
Constipation
Abdominal discomfort,
Blood and/or mucus in stools in an otherwise well infant

Skin
Pruritus, erythema
Significant atopic eczema

Respiratory
‘Catarrhal’ airway symptoms
(usually in combination with one or more of the above symptoms)

Can be managed in Primary Care
See Management Algorithm
Primary Care Management of Mild to Moderate Non-IgE CMA
(No initial IgE Skin Prick Tests or Serum Specific IgE Assays necessary)

**Exclusively Breast-Fed**

Strict Exclusion of cow’s milk containing foods from Maternal Diet
- Maternal supplements of Calcium (1000mg) and Vitamin D (10mcg) daily
- Refer to dietitian
- If CMA - most symptoms will settle well within the agreed 2-4 week Elimination Diet

No Improvement ▼ Improvement - need to confirm Diagnosis

CMA still suspected:
- Need to consider other maternal foods e.g. egg
- Refer to a paediatrician with an interest in allergy

CMA no longer suspected:
- Return to usual maternal diet
- Consider referral to general paediatricians if symptoms persist

Home Challenge: Mum to revert to normal diet containing cows’ milk containing foods over period of one week (to be done between 2-4 weeks of starting Elimination Diet)

No return of Symptoms: ▼ Symptoms return

Symptoms not set: ▼ Symptoms do not settle

Exclude cow’s milk containing foods from maternal diet again.
- If symptoms settle: CMA NOW CONFIRMED
- If top-up formula feeds needed: Use an AAF

A planned Reintroduction or Supervised Challenge is then needed to determine if tolerance has been achieved
- Performing a Reintroduction vs. a Supervised Challenge is dependent on the answer to the question:
  - Does the child have Current Eczema or ANY history at ANY time of acute onset symptoms?

**Formula-Fed or ‘Mixed Feeding’ (Breast and Formula)**

Strict Cow’s Milk Protein free Diet

Formula-fed - Trial of an Extensively Hydrolysed Formula (eHF) in infant
- Mixed feeding - Trial of a cow’s milk free Maternal Diet
- With eHF top-ups for infant if needed
- Refer to dietitian
- If CMA - most symptoms will settle well within the agreed 2-4 week Elimination Diet

Improvement - need to confirm Diagnosis ▼ No Improvement

Perform Home Challenge using cow’s milk formula
- (to be done between 2-4 weeks of starting Elimination Diet)

Symptoms return ▼ No return of Symptoms:

Symptoms return ▼ Symptoms not set

Return to the eHF again.
- If symptoms settle: CMA NOW CONFIRMED

CMA still suspected:
- Refer to a paediatrician with an interest in allergy
- Consider a trial of AAF

CMA no longer suspected:
- Unrestricted diet again
- Consider referral to general paediatricians if symptoms persist

Cow’s milk free diet until 9-12 months of age and for at least 6 months – with support of dietitian

**History of acute onset symptoms at any time**
- Serum Specific IgE or Skin Prick Test needed

- **Current Eczema**
  - Check Serum Specific IgE or Skin Prick Test to cow’s milk

- **Negative**
  - Liaise with local Allergy Service Re: Challenge (or tests not available)
  - Refer to a paediatrician with an interest in allergy (A Supervised Challenge may be needed)

- **Positive**
  - (Tests not available)

**And no history at any stage of acute onset symptoms**
- Reintroduction at Home to test for Tolerance

- **Current Eczema**
  - Check Serum Specific IgE or Skin Prick Test to cow’s milk

- **Negative**
  - Reintroduction at Home to test for Tolerance

- **Positive**
  - (Tests not available)
  - Refer to a paediatrician with an interest in allergy (A Supervised Challenge may be needed)
**Exclusively Breast-Fed**

**Strict Exclusion of cow’s milk containing foods from Maternal Diet**
- Maternal supplements of Calcium (1000mg) and Vitamin D (10mcg) daily
- Refer to dietitian
- If CMA - most symptoms will settle well within the agreed 2-4 week Elimination Diet

**No Improvement**
- **Improvement** - need to confirm Diagnosis

- **CMA still suspected:**
  - Need to consider other maternal foods e.g. egg
  - Refer to a paediatrician with an interest in allergy

- **CMA no longer suspected:**
  - Return to usual maternal diet
  - Consider referral to general paediatricians if symptoms persist

**Home Challenge:** Mum to revert to normal diet containing cows’ milk containing foods over period of one week (to be done between 2-4 weeks of starting Elimination Diet)

**No return of Symptoms:**
- **NOT CMA**

**Symptoms return**
- Exclude cow’s milk containing foods from maternal diet again.
- If symptoms settle:
  - **CMA NOW CONFIRMED**

**Cow’s milk free diet until 9-12 months of age and for at least 6 months – with support of dietitian**

**A planned Reintroduction or Supervised Challenge** is then needed to determine if tolerance has been achieved

Performing a Reintroduction vs. a Supervised Challenge is dependent on the answer to the question:

Does the child have **Current Eczema** or **ANY history at ANY time of acute onset symptoms**?

---

**No Current Eczema**
- And no history at any stage of acute onset symptoms
- **Reintroduction at Home** to test for Tolerance

**Current Eczema**
- Check Serum Specific IgE or Skin Prick Test to cow’s milk

- **Negative**
  - **Positive**

- **History of acute onset symptoms at any time**
  - Serum Specific IgE or Skin Prick Test needed

  - **Negative**
    - Liaise with local Allergy Service Re: Challenge (or tests not available)
  - **Positive**

  - Refer to a paediatrician with an interest in allergy (A Supervised Challenge may be needed)
Primary Care Management of Mild to Moderate Non-IgE CMA  
(No initial IgE Skin Prick Tests or Serum Specific IgE Assays necessary)  

**Formula-Fed or ‘Mixed Feeding’ (Breast and Formula)**

- **Strict Cow’s Milk Protein free Diet**
  - Formula-fed: Trial of an Extensively Hydrolysed Formula (eHF) in infant
  - Mixed feeding: Trial of a cow’s milk free Maternal Diet
    - With eHF top-ups for infant if needed
    - Refer to dietitian
  - If CMA - most symptoms will settle well within the agreed 2-4 week Elimination Diet
  - **Improvement** - need to confirm Diagnosis

**No Improvement**

- **Perform Home Challenge using cow’s milk formula**
  - (to be done between 2-4 weeks of starting Elimination Diet)
  - **Symptoms return**
    - **Return to the eHF again.**
    - If symptoms settle: **CMA NOW CONFIRMED**
  - **Symptoms do not settle**
    - **CMA still suspected:**
      - Refer to a paediatrician with an interest in allergy
      - Consider a trial of AAF
    - **CMA no longer suspected:**
      - Unrestricted diet again
      - Consider referral to general paediatricians if symptoms persist

**Cow’s milk free diet until 9-12 months of age and for at least 6 months – with support of dietitian**

A planned **Reintroduction or Supervised Challenge** is then needed to determine if tolerance has been achieved

performing a Reintroduction vs. a Supervised Challenge is dependent on the answer to the question:

Does the child have **Current Eczema** or **ANY** history at **ANY** time of acute onset symptoms ?

**No Current Eczema**

- **And no history at any stage of acute onset symptoms**
  - (No need to check Serum Specific IgE or perform Skin Prick Test)
  - **Reintroduction at Home** to test for Tolerance

- **And still no history at any stage of acute onset symptoms**
  - **Reintroduction at Home** to test for Tolerance

**Current Eczema**

- **Check Serum Specific IgE or Skin Prick Test to cow’s milk**
  - **Negative**
    - **No return of Symptoms:**
    - **NOT CMA**
  - **Positive**
    - **History of acute onset symptoms at any time**
      - **Serum Specific IgE or Skin Prick Test needed**
      - **Negative**
        - Liaise with local Allergy Service Re: Challenge (or tests not available)
      - **Positive**
        - Refer to a paediatrician with an interest in allergy (A Supervised Challenge may be needed)

The Hypoallergenic Formulas

The constituents vary between the different individual Extensively Hydrolysed Formulas (eHFs) available and also between the different individual Amino Acid Formulas (AAF) available. This can sometimes influence both an infant’s clinical tolerance and even their perceived apparent palatability of that formula.

The Hypoallergenic Formulas currently most commonly used in the infant age group in the UK for term infants are:

**Extensively Hydrolysed Formulas - eHFs**

<table>
<thead>
<tr>
<th>Casein-based constituents</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alimentum</strong></td>
<td>Birth onwards</td>
<td>Abbott Nutrition</td>
<td>400g tin</td>
<td></td>
</tr>
<tr>
<td><strong>Nutramigen LIPIL 1</strong></td>
<td>Birth onwards</td>
<td>Mead Johnson</td>
<td>400g tin</td>
<td></td>
</tr>
<tr>
<td><strong>Nutramigen LIPIL 2</strong></td>
<td>&gt; 6 months of age</td>
<td>Mead Johnson</td>
<td>400g tin</td>
<td></td>
</tr>
</tbody>
</table>

**Whey-based constituents*  

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Milupa Aptamil Pepti 1</strong></td>
<td>Birth onwards</td>
<td>Milupa</td>
<td>400g or 900g tin</td>
<td></td>
</tr>
<tr>
<td><strong>Milupa Aptamil Pepti 2</strong></td>
<td>&gt; 6 months of age</td>
<td>Milupa</td>
<td>400g or 900g tin</td>
<td></td>
</tr>
<tr>
<td><strong>Althéra</strong></td>
<td>Birth onwards</td>
<td>Vitaflol</td>
<td>450g tin</td>
<td></td>
</tr>
</tbody>
</table>

* Both the whey based extensively hydrolysed formulas contain lactose

**Amino Acid-based Formulas - AAF**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neocate LCP</strong></td>
<td>Birth onwards</td>
<td>Nutricia SHS</td>
<td>400g tin</td>
<td></td>
</tr>
<tr>
<td><strong>Nutramigen AA LIPIL</strong></td>
<td>Birth onwards</td>
<td>Mead Johnson</td>
<td>400g tin</td>
<td></td>
</tr>
</tbody>
</table>

These are the formulas currently available in the UK, but the range may be different in each country or expanded.
## Cost Comparison

### Extensively hydrolysed formula

<table>
<thead>
<tr>
<th>Product</th>
<th>Price (£) per 400g tin</th>
<th>Price(£) per 240ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Althera</td>
<td>9.10</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>(10.68 for 450g)</td>
<td></td>
</tr>
<tr>
<td>Aptamil Pepti 1</td>
<td>8.62</td>
<td>0.70</td>
</tr>
<tr>
<td>Aptamil Pepti 2</td>
<td>8.61</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>(19.38 for 900g)</td>
<td></td>
</tr>
<tr>
<td>Nutramigen Lipil 1</td>
<td>9.29</td>
<td>0.75</td>
</tr>
<tr>
<td>Nutramigen Lipil 2</td>
<td>8.95</td>
<td>0.78</td>
</tr>
<tr>
<td>Similac Alimentum</td>
<td>9.49</td>
<td>0.71</td>
</tr>
</tbody>
</table>

### Amino acid based formula

<table>
<thead>
<tr>
<th>Product</th>
<th>Price (£) per 400g</th>
<th>Price(£) per 240ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neocate LCP</td>
<td>23.83</td>
<td>2.10</td>
</tr>
<tr>
<td>Nutramigen AA</td>
<td>22.89</td>
<td>1.86</td>
</tr>
</tbody>
</table>

### Amino Acid based formula >1 Year

<table>
<thead>
<tr>
<th>Product</th>
<th>Price per 300ml serving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neocate Advance</td>
<td>2.59</td>
</tr>
<tr>
<td>Neocate Active</td>
<td>3.73</td>
</tr>
</tbody>
</table>
Know your formulas

- Breast-feeding is always the preferred way to feed any infant. In any case where there is a need to exclude cow’s milk from the maternal diet and a top-up formula is needed, an amino acid based formula (AAF) should be chosen.
- AAF is recommended as a first line of treatment for those infants with a history of anaphylaxis to cow’s milk, Heiner Syndrome, Eosinophilic Eosophagitis and severe gastro-intestinal and/or skin presentations, particularly in association with faltering growth.
- Extensively hydrolysed formula (eHF) is recommended as a first line of choice for infants with mild to moderate presentations of CMA e.g. colic, reflux, diarrhoea, vomiting, eczema in the absence of faltering growth. eHF containing whey may not be suitable as a first line of treatment for those infants with possible secondary lactose intolerance.
- Soya formula can be used in infants over 6 months of age who do not tolerate the eHF, particularly if they are suffering from IgE mediated CMA in the absence of sensitisation to soya.

Venter et al. 2013
Case 1: Baby J

- Presented at 5 months of age with severe eczema
- Atopic parents of Caucasian descent
- Increasingly **severe eczema** from 2 months
- GP prescribed emollients and steroid cream but does not control the eczema
Case 1: Baby J

- Growth: length and HC following the 25th centile, but **weight starting to drop from this centile** (now between the 9° and 25° centile)
- **Frequent loose stools**, irritable and disrupted sleep
- Exclusively breast fed up to now
Question 1: Would you consider a CMPA in this child?

1. Yes
2. No
Question 2: What to advise mum

1. Avoid all cow’s milk and cow’s milk containing foods for now with maternal supplementation of 1000 mg Ca and 10 ug Vit D
2. Continue with current diet and see what happens
3. Stop breast feeding and change to hypoallergenic formula
After 2-4 week elimination

• Simply advise the mother to reintroduce cow’s milk and milk containing foods gradually back into her own diet over a 1 week period.

• If no symptoms return within 2 weeks of the mother consuming milk products then the infant does not have cow’s milk allergy.

• Mother may continue to consume cow's milk and milk containing products.

• But in this case (Baby J)...severe eczema and loose stools return; crying and unsettled baby.
Question 3: Mum would like to stop breastfeeding, which formula would you suggest?

1. A cow’s milk formula?
2. Goat’s milk formula?
3. Soya milk?
4. Extensively hydrolysed formula?
5. Amino Acid formula (AAF)?
Just for interest: Baby J: SPT results

- Milk: 3 mm
- Egg white: 4 mm
- Soya: 0 mm
- Wheat: 0 mm
- Cod: 0 mm
- Prawn: 0 mm
- Peanut: 0 mm
- Cashew: 1 mm
- Hazelnut: 0 mm
Case 2: Baby A

- Atopic parents: dad hay fever and mum asthma
- **Mild eczema in early infancy** (well controlled with emollients)

- Exclusively breast fed for 6 months

- Maintaining growth
Case 2: Baby A

- Developed **urticaria and angioedema** after first bottle of cow’s milk formula at 6 months

- Given goat’s milk as an alternative but suffered same reaction

- Specific IgE to milk 40 kuA/L
Question 1: What would you suggest

1. Extensively hydrolysed formula - whey
2. Extensively hydrolysed formula - casein
3. Amino Acid Based formula
4. Try goat’s milk again
5. Mum’s choice of rice/oat/coconut milk
6. Soya milk
4 weeks later

- No reaction to foods free from cow’s milk
- Diagnosis need to confirm with a hospital challenge
  - But if there was no IgE involvement...and no eczema

Day 1 30mls of Cow’s milk formula into ONE morning bottle only.
Days 2 – 7 Continue to increase the cow’s milk formula IN the ONE morning bottle and reduce the Hypoallergenic formula using the following example.

<table>
<thead>
<tr>
<th>Following Days</th>
<th>Volume of Boiled Water (mls)</th>
<th>Cow’s milk Formula No. of Scoops</th>
<th>Hypoallergenic Formula No. of Scoops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 2</td>
<td>180</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Day 3</td>
<td>180</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Day 4</td>
<td>180</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Day 5</td>
<td>180</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Day 6</td>
<td>180</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Day 7</td>
<td>180</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>
1 Year Later

• Mum Phones: “I think he may be OK with milk – he had a biscuit (has milk powder in) and nothing happened..... Although he definitely reacted when we tried him with a yoghurt.”

• Does he really need to be avoiding everything with milk in?
**Question:** Should he be completely avoiding milk?

1. Yes
2. No
3. Further testing required; if SPT and/or specific IgE negative – food challenge at home
4. Further testing required; if SPT and/or specific IgE positive – food challenge at home

....all tests are negative
Practical Pointers on using the MAP ‘MILK LADDER’ for Parents

The following ‘Pointers’ should make it easier for you to understand how best to use this Ladder. We advise that you are supported by a Health Care Professional (HCP) until the Ladder has been successfully climbed. This may be your doctor, nurse or ideally your dietitian.

- Before starting the Ladder and progressing to each further Step, please ensure that your child is well at the time and also that any gastrointestinal symptoms or eczema are settled.

- Most children will start on Step 1. Some may already eat one or more of the foods on the Ladder. If that is the case, you need to be advised which Step of the Ladder you should start on.

- The Ladder has 12 Steps, but your HCP may adjust the number of Steps to suit your child best.

- The time spent on each Step will vary from one child to another (e.g. one day or 1 week) and this should also be discussed and agreed with you.

- The amounts in the Ladder are given as a guide - occasionally smaller or larger amounts may be recommended.

- The Ladder includes commercially available and home-made options. Recipe ideas are available at:
  http://www.ctajournal.com/media/1795283721029345/supp3.docx
  Each of the recipes has an egg and wheat free option (they are all soya free) to make the Ladder suitable for those children who may have other co-existing allergies.

- If the food on any Step of the Ladder is tolerated, your child should continue to consume this (as well as all the foods in the previous Steps) and then try the food suggested on the next agreed Step.

- If your child does not tolerate the food in a particular Step, simply go back to the previous one. You should then be advised when that next Step can be tried again.

In a few of the more severe cases of CMA a more cautious start to the Milk Ladder may be recommended, beginning with smaller amounts in Step 1, e.g. a ¼ or ½ of a malted milk biscuit.

Carina Venter, Trevor Brown, Neil Shah, Joanne Walsh, Adam T. Fox
Clin Transl Allergy. DOI 10.11862045-7022-3-23 (additional file 1 and 3)

Oct 2013
Now 19 months... does he still need formula?

- Dietetic Assessment
- Usually not before 2 years

<table>
<thead>
<tr>
<th>PER 100ml</th>
<th>Neocate</th>
<th>Neocate advance</th>
<th>Neocare Active</th>
<th>Nutramigen AA</th>
<th>Nutramigen 2</th>
<th>Althera</th>
<th>Pepti 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kcal</td>
<td>70</td>
<td>100</td>
<td>100</td>
<td>68</td>
<td>68</td>
<td>67</td>
<td>68</td>
</tr>
<tr>
<td>Prot g</td>
<td>1.9</td>
<td>2.5</td>
<td>2.8</td>
<td>1.89</td>
<td>1.7</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Ca mg</td>
<td>68.5</td>
<td>50</td>
<td>95.1</td>
<td>64</td>
<td>94</td>
<td>40.9</td>
<td>63</td>
</tr>
<tr>
<td>Vit. D ug</td>
<td>1.2</td>
<td>0.82</td>
<td>0.83</td>
<td>0.85</td>
<td>1.1</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>Iron Mg</td>
<td>1</td>
<td>0.62</td>
<td>1.3</td>
<td>1.22</td>
<td>1.2</td>
<td>0.73</td>
<td>1</td>
</tr>
</tbody>
</table>
Cow’s Milk Free alternatives for children over 2 years

<table>
<thead>
<tr>
<th>PER 100ml</th>
<th>Neocate Advance</th>
<th>Almond milk Fortified</th>
<th>Hazelnut drink Fortified</th>
<th>Rice Milk Fortified</th>
<th>Oat milk Fortified</th>
<th>Chufa milk Fortified</th>
<th>Potato milk Fortified</th>
<th>Pea milk</th>
<th>Coconut Fortified</th>
<th>Hemp Fortified</th>
<th>Alpro 1+ Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>kcal</td>
<td>100</td>
<td>24</td>
<td>29</td>
<td>47</td>
<td>45</td>
<td>66</td>
<td>35</td>
<td>NA</td>
<td>27</td>
<td>39</td>
<td>62</td>
</tr>
<tr>
<td>Protein g</td>
<td>2.5</td>
<td>0.5</td>
<td>0.3</td>
<td>0.1</td>
<td>1</td>
<td>0.35</td>
<td>0</td>
<td>NA</td>
<td>0.2</td>
<td>&lt;0.1</td>
<td>2.6</td>
</tr>
<tr>
<td>Calcium mg</td>
<td>50</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>NA</td>
<td>120</td>
<td>NA</td>
<td>120</td>
<td>120</td>
<td>100</td>
</tr>
<tr>
<td>Riboflavin mg</td>
<td>0.08</td>
<td>0.21</td>
<td>0.21</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>0.21</td>
</tr>
<tr>
<td>Vit. B12 μg</td>
<td>0.07</td>
<td>0.38</td>
<td>0.38</td>
<td>NA</td>
<td>0.38</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>0.19</td>
</tr>
<tr>
<td>Vit. D μg</td>
<td>0.82</td>
<td>1.25</td>
<td>0.75</td>
<td>1.25</td>
<td>0.5</td>
<td>NA</td>
<td>0.3</td>
<td>NA</td>
<td>NS</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Iron</td>
<td>0.62</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Look out for...

There are many ways in which cow’s milk can be labelled, so carefully check the ingredients list on food items and avoid foods which contain:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Common Ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow’s milk (fresh, UHT)</td>
<td>Butter milk, butter oil</td>
</tr>
<tr>
<td>Evaporated milk</td>
<td>Condensed milk</td>
</tr>
<tr>
<td>Yogurt, fromage frais</td>
<td>Cheese</td>
</tr>
<tr>
<td>Margarine</td>
<td>Butter, Ghee</td>
</tr>
<tr>
<td>Ice cream</td>
<td>Cream/ artificial cream</td>
</tr>
<tr>
<td>Milk powder</td>
<td>Skimmed milk powder</td>
</tr>
<tr>
<td>Milk protein</td>
<td>Milk sugar</td>
</tr>
<tr>
<td>Milk solids</td>
<td>Whey, whey solids</td>
</tr>
<tr>
<td>Whey protein</td>
<td>Casein (curds), caseinates</td>
</tr>
<tr>
<td>Calcium caseinate</td>
<td>Hydrolysed casein</td>
</tr>
<tr>
<td>Hydrolysed whey protein</td>
<td>Sodium caseinate</td>
</tr>
<tr>
<td>Lactoglobulin</td>
<td>Modified milk</td>
</tr>
<tr>
<td>Lactoalbumin</td>
<td></td>
</tr>
</tbody>
</table>

Lactose - in most cases only needs to be avoided if your child has lactose intolerance or is highly allergic to cow’s milk protein
Other help and support

• List of foods to avoid
• List of suitable foods
  – Supermarkets (own brands only) and manufacturers produce “free from lists”.
• How to read food labels
• Diet sheets
• Weaning booklets or recipe books
  – Cooking one’s own food saves money, gives more variety and is more tasty with less additives.
• Child care arrangements
Online shopping

• www.goodnessdirect.co.uk : info@goodnessdirect.co.uk Tel: 0871 871 6611
• www.dietaryneedsdirect.co.uk: info@dietaryneedsdirect.co.uk
  Tel: 01527 570444. Wide range of free from foods. Delivery charges start at £1.95 and increase with weight.
• www.allergyessex.co.uk: Wide range of free from foods.
• www.intolerablefood.com: Allergy free ready meals
• www.plamilfoods.co.uk : Milk free products.
• www.alotofchocolate.co.uk: Stockists of different brands of milk free chocolates.
• www.redwoodfoods.co.uk: Milk free cheeses
• www.buteisland.com: Milk free cheeses
• www.veggiestuff.com: Wide range of milk free products
• www.puredairyfree.co.uk: Milk free margarines. Available from supermarkets.
• www.worthenshaws-freedom.co.uk: Milk free ice cream
• www.swedishglace.com: Soya ice cream available from supermarkets, online and health food stores.
Thank you

Team at the David Hide Asthma and Allergy Research Centre
Prof SH Arshad
Prof Tara Dean

For doctors, nurses, health visitors, dietitians and others in all health care sectors

http://www.southampton.ac.uk/medicine/postgraduate/taught_courses/msc_allergy.page