NUTRICIA
KetoCal®

COULD YOUR Diet Plan BE THE keto

BILLY'S FIRST SWIM WITH HIS mum?

A range of products to support all forms of Ketogenic Diet Therapy, designed to improve seizure control and dietary adherence. Please refer to product label for details.

The Nutricia keto genics range

This information is intended for Healthcare Professionals only.

All products shown are Foods for Special Medical Purposes for the dietary management of intractable or drug resistant epilepsy and must be used under medical supervision.

Accurate at date of publication: September 2024

NCBS0167UK

KETOCAL'S EFFECTIVENESS IN SEIZURE REDUCTION BACKED BY MORE THAN 35 SCIENTIFIC STUDIES IN OVER 1,400 PATIENTS WORLDWIDE*

OVER 20 YEARS OF RESEARCH

OVER 35 PUBLICATIONS

*Data on file

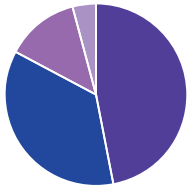
THE **FACTS**

Drug-Resistant Epilepsy

600,000 people in the UK are diagnosed with epilepsy and receive anti-epileptic drug (AED) treatment; that's 1 in every 103 people[1]

Drug-resistant epilepsy is the failure of 2 or more appropriately chosen AEDs to achieve seizure freedom[2]

36% of epilepsy patients have inadequate control of seizures with AEDs[2]



Chances of AED success diminishes after every failure[5]

- **47%** seizure free 1st AED
- **13%** seizure free 2nd AED
- **4%** seizure free 3rd or multiple AEDs
- **36%** Not seizure free

N=470 previously untreated epilepsy patients treated with AEDs

Uncontrolled epilepsy can increase the risk of injury, hospital visits, depression, anxiety and SUDEP (Sudden Unexpected Death in Epilepsy)[3]

AEDs are commonly associated with side-effects such as drowsiness, blurred vision, dizziness, nausea and vomiting[4]

Drug-resistant epilepsy may require an alternative management option

References:

1. Joint Epilepsy Council (2011) Epilepsy Prevalence, Incidence and Other Statistics, Available at: http://www.jointepilepsycouncil.org.uk/ (Accessed: 16th April 2018).
2. Kwan, P., Arzimanoglou, A. and Berg, A (2010) 'Definition of Drug-resistant Epilepsy: Consensus Proposal by the Ad Hoc Task Force of the ILAE Commission on Therapeutic Strategies', Epilepsia, 51(6), pp. 1069–1077
3. Epilepsy Society (2018) Risks with Epilepsy, Available at: https://www.epilepsysociety.org.uk/risks-epilepsy#.W6DyWehKjIU (Accessed: 18th September 2018).
4. Epilepsy Foundation (2018) Risks with Epilepsy, Available at: https://www.epilepsysociety.org.uk/risks-epilepsy#.W6DyWehKjIU (Accessed: 18th September 2018).
5. Kwan, P. and Brodie, M.J (2000) 'Early identification of refractory epilepsy', New England Journal of Medicine, 342(5), pp. 314–319.

TYPES OF **KETOGENIC DIET THERAPY (KDT)**

There are 4 different versions of ketogenic diet. All have restricted carbohydrate, are rich in fats and provide sufficient protein to support growth and development. Research has shown that all versions of the diet are effective in reducing seizures.*

Classical Ketogenic Diet

This is a high-fat, low-carbohydrate diet which follows a strict 3:1 to 4:1 ratio of fats to combined protein and carbohydrates. This diet requires precise measurements and careful monitoring. It is commonly used in infants and enterally fed patients. A 4:1 ratio means 4 grams of fat for every 1 gram of protein and carbohydrate.

Modified Ketogenic Diet

This diet focuses on restricting carbohydrate while allowing unrestricted protein intake, with fat remaining the primary energy source. The modified diet can be more flexible and easier to follow, making it popular among older children and young adults.

MCT (Medium Chain Triglyceride) DIET

This diet uses MCTs as the primary fat source. MCTs are more easily absorbed and converted into ketones by the body, allowing for a higher carbohydrate and protein intake compared to other ketogenic diets. This diet provides more flexibility with food choices, and it is sometimes easier to follow due to the increased variety of allowed foods.

Low Glycaemic Index Treatment (LGIT)

This diet focuses on both the amount and type of carbohydrate allowed each day, maintaining a high fat content similar to other ketogenic diets. It allows generous quantities of low-GI carbohydrates, which raise blood sugar levels slowly and are typically high in fibre.

Nutricia produces a range of recipe books to support each variation of KDT. MyKetoPlanner.co.uk is a web-based platform with thousands of recipes for different types of ketogenic diet therapy.

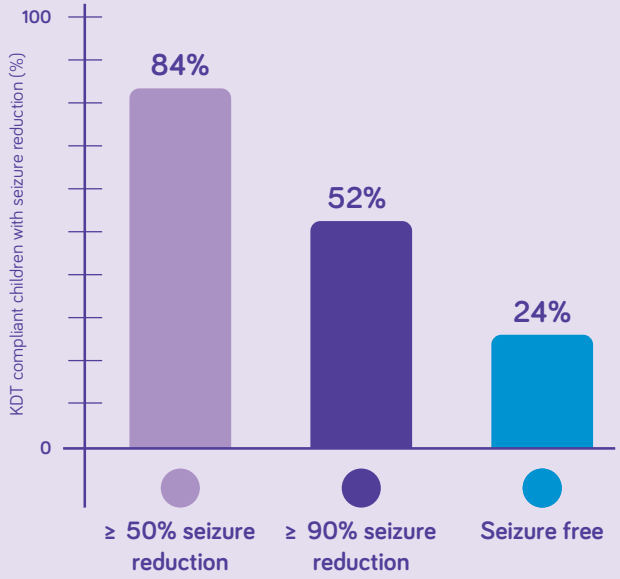
*Martin-McGill KJ et al. Ketogenic diets for drug-resistant epilepsy. Cochrane Database of Systematic Reviews 2020, Issue 6. Art. No.: CD001903. DOI:10.1002/14651858.CD001903.pub5

THE **EVIDENCE**

Anti-Epileptic Drugs (AEDS)

Up to 30% of children with epilepsy are believed to continue to have seizures despite the appropriate use of multiple anticonvulsants.[1] Polypharmacy and dose escalation threaten childhood development: sedation, confusion and cognitive development.[2]

Meta-analysis of seizure reduction rates with ketogenic diet[6]



Paediatric Epilepsy

KDT offers proven effective seizure control without the burden of AED related cognitive side effects.[3,4]

A meta-analysis has shown that the majority of children compliant to KDT achieved seizure control.[2]

- **84%** of children compliant to KDT responded with at least **50%** seizure reduction
- **1 in 4** children compliant to KDT achieved **complete seizure freedom**

NICE Guidance 2022:
Refer children with epilepsy whose seizures have not improved on appropriate AEDs to a tertiary paediatric specialist for consultation on the use of KDT[13]

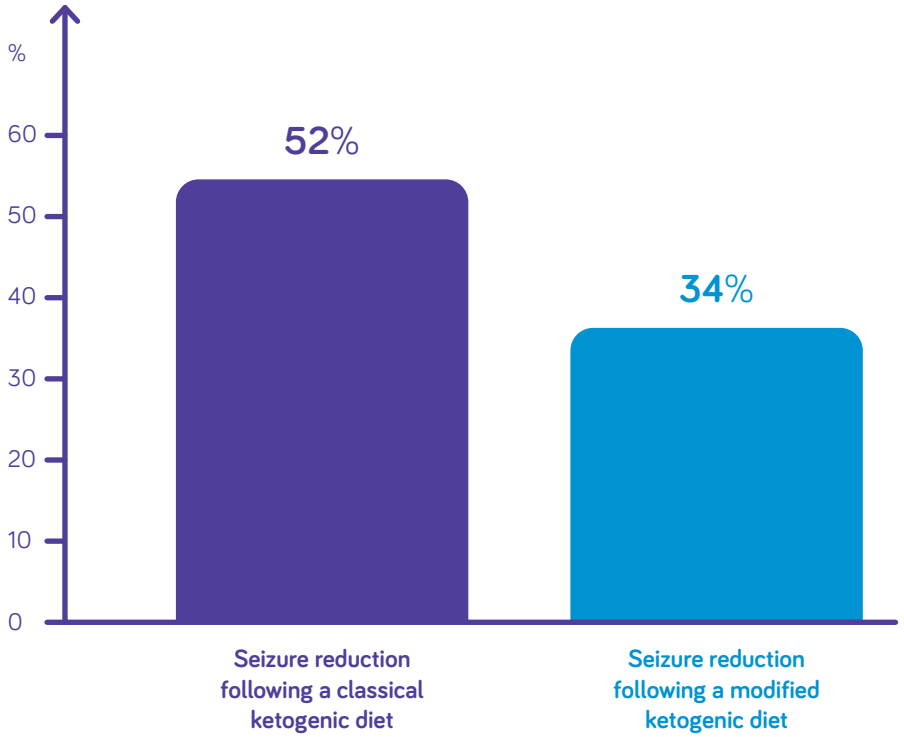
KDT - Ketogenic Diet Therapy

References:
1. Marsh EB, Freeman JM, Kossoff EH et al. The outcome of children with intractable seizures: a 3- to 6-year follow-up of 67 children who remained on the ketogenic diet less than one year. Epilepsia,2006 Feb;47(2):425-30.
2. Henderson CB, Filloux FM, Alder SC et al. Efficacy of the Ketogenic Diet as a Treatment Option for Epilepsy: Meta-analysis. J Child Neurol, 2006 Mar;21(3):193-8.
3. Neal EG, Chaffe H, Schwartz RH et al. The ketogenic diet for the treatment of childhood epilepsy: a randomised controlled trial. Lancet Neuro, 2008 Jun;7(6):500-6. Epub 2008 May 2.
4. Rubinstein JE et al. Use of the ketogenic diet in neonates and infants. Epilepsia, 2008;49(suppl8):30-32.18.
5. NICE Epilespsies in children, young people and adults. Clinical Guideline [ng217] Published April 2022

THE **EVIDENCE**

Efficacy for KDT in adolescents and adults

Adult patients achieving a >50% reduction in seizures



Meta-analysis indicating that KDT is an effective management option in adults with drug-resistant epilepsy (n=270)

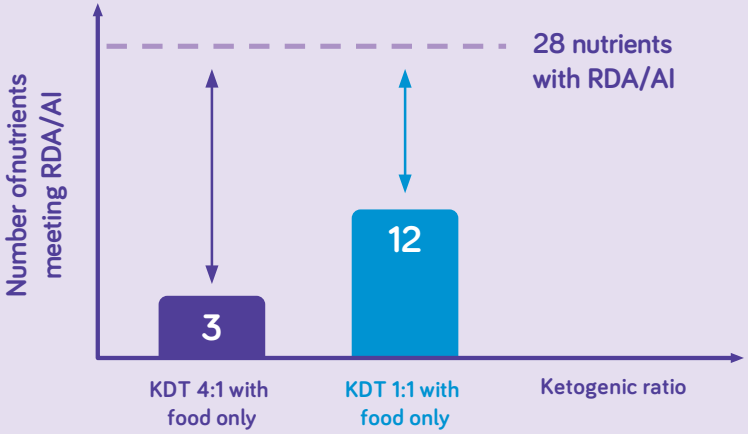
- Success rates up to 70% have been reported in adults using KDT.[1]
- Approximately half of all adolescents and adults that commence KDT can expect at least a 50% reduction in seizures.[2,3]
- Modified KDT is often tolerated better in adults and adherence can be high where seizure reduction benefits are seen.[4]

KDT - Ketogenic Diet Therapy

References:
1. Fang, Y., Xiao-Jai, L. et al. (2015) 'Efficacy of and Patient Compliance with a Ketogenic Diet in Adults with Intractable Epilepsy: A Meta-Analysis', Journal of Clinical Neurology, 11(1), pp. 26–31.
2. Kossoff, E.H. and Dorward, J.L. (2008) 'The Modified Atkins Diet', Epilepsia, 49(8), pp. 37–41.
3. McDonald, T.J.W., Henry-Barron, B.J. et al (2018) 'Improving Compliance in Adults with Epilepsy on a Modified Atkins Diet: A Randomized Trial', Seizure, 60(10), pp. 132–138.
4. Sirven, J. and Whedon, B et al. (1999) 'The Ketogenic Diet for Intractable Epilepsy in Adults: Preliminary Results', Epilepsia, 40(12), pp. 1721–1726

AN EASIER WAY TO BRIDGE THE GAP
OF NUTRIENT DEFICIENCIES SEEN IN THE KDT*

CHALLENGES WITH THE ORAL KETOGENIC DIET†[1]



†With food only; no supplementation.
AI=adequate intake; RDA=recommended dietary allowance.

HOW KETOCAL HELPS

One serving per day helps fill in nutrient gaps known to exist with the ketogenic diet therapy[1]

Whether patients use KetoCal as a sole source or as supplemental nutrition, it provides complete nutrition to meet their needs

*KDT - Ketogenic Diet Therapy

References:

1. Zupec-Kania B, et al. Long-term management of the ketogenic diet: seizure monitoring, nutrition, and supplementation. Epilepsia. 2008;49 Suppl 8:23-6.

NUTRICIA OFFERS A COMPREHENSIVE NUTRITION PORTFOLIO, **ENRICHED BY OVER 20 YEARS OF RESEARCH**

Nutricia **co-created the first ketogenic diet formula** in 1998 with John Hopkins Hospital, Baltimore USA

Celebrating 25 years of KetoCal

Backed with **over 20 years of research and over 35 publications***

*Data on file

FEATURES AND BENEFITS

	Suitable as the sole source of nutrition	Can be used in all forms of ketogenic diet therapy	Can be easily adapted to different ketogenic ratios	Quicker and easier preparation of ketogenic meals, as drink, in meals or as a tube feed	Advanced fat profile – reduced saturated fat and inclusion of EFA's and DHA	Contains 6 different fibres to help maintain bowel function as fibre intake is reduced on a KDT[1]	Suitable from 1+ y.o	Suitable from birth	Easily incorporated into a range of recipes to help aid compliance	Ideal for using as a supplement to boost ketosis	≥50% fat emulsion so low volumes needed to achieve requirements
KETOCAL 4:1	✓	✓	✓	✓	✓	✓	✓		✓		
KETOCAL 4:1 LQ	✓	✓	✓	✓	✓	✓	✓		✓	✓	
KETOCAL 3:1	✓	✓	✓	✓	✓		✓	✓	✓		
KETOCAL 2.5:1 LQ	✓	✓	✓	✓	✓	✓	✓		✓	✓	
MCT OIL		✓					✓	✓	✓	✓	✓
LIQUIGEN		✓					✓	✓	✓	✓	✓

EFA: Essential fatty acids
DHA: Docosahexaenoic acid

References:
1. Bergqvist AG. Long-term monitoring of the ketogenic diet: Do's and Don'ts. Epilepsy Res. 2012;100(3):261–6

KETOCAL 4:1 POWDER

A 4:1, nutritionally complete powder feed which can be used in all forms of KDT

FEATURES	BENEFITS
Suitable as the sole source of nutrition or for supplementary feeding	Reassuring and convenient, it minimises the need for additional supplementation
Available in vanilla or unflavoured	A convenient ingredient for both sweet and savoury ketogenic meals and drinks
4:1 ratio (fat: carbohydrate + protein)	Peace of mind through accurate ratio and nutritional profile
Advanced fat profile	Reduces the intake of saturated fat for long-term health benefits and includes the EFAs, DHA and AA and LCPs[1-3]
Contains multifibre 6	To help meet fibre needs, as fibre intake is reduced on a KDT, and to support gut health[4,5]
Contains carnitine	Plays an important role in energy metabolism[6] and can be deficient in patients taking certain AEDs[7]

NUTRITION INFORMATION

Macro-Nutrients			
Nutrients	**Unit**	**per 100g**	**per 100ml**
Energy	kcal	703	100
	kJ	2897	411
Protein	g	14.4	2
Carbohydrate	g	2.9	0.41
sugars	g	0.68	0.10
lactose	g	0.17	0.024
Fat	g	69.2	9.8
saturates	g	26.1	3.7
monounsaturates	g	22.7	3.2
polyunsaturates	g	20.4	2.9
LCT	%	100	100
n6:n3	ratio	10:7	10:7
Arachidonic Acid (AA)	mg	120	17
Docosahexaenoic Acid (DHA)	mg	110	15.6
Fibre	g	5.4	0.77
Other nutrient information			
L-Carnitine	mg	45	6.4
Choline	mg	320	45.5
Inositol	mg	19.1	2.7

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

EFAs - Essential Fatty Acids. DHA – Docosahexaenoic acid. AA – Amino acid. LCPs - Long chain polyunsaturated fatty acids.

LCT - Long-Chain Triglycerides.

References:
1. Fuehrlein, B.S., Rutenberg, M.S. et al. (2004) 'Differential Metabolic Effects of Saturated Versus Polyunsaturated Fats in Ketogenic Diets', Journal of Clinical Endocrinology Metabolism, 89(4), pp. 1641-1645.
2. Dahlin M. Plasma phospholipid fatty acids are influenced by a ketogenic diet enriched with n-3 fatty acids in children with epilepsy. Epilepsy Res. 2007;73:199–207.
3. Kwiterovich P.O., Vining EPG, Pyzik P. et al. Effect of a High-Fat Ketogenic Diet on Plasma Levels of Lipids, Lipoproteins, and Apolipoproteins in Children. Journal of American.
4. Bergqvist AG. Long-term monitoring of the ketogenic diet: Do's and Don'ts. Epilepsy Res. 2012;100(3):261–6
5. Elia M., Engfer M.B. et al. (2008) 'Systematic Review and Meta-Analysis: the Clinical and Physiological Effects of Fibre-Containing Enteral Formulae' Alimentary Pharmacology Therapeutics, 27(2), pp. 120–145.
6. Flanagan, J.L, Simmons P.A. et al. (2010) 'Role of Carnitine in Disease', Nutrition & Metabolism, 7 (30), pp 1743-1775.
7. Coppollo, G, Epifanio, G. et al. (2006) 'Plasma Free Carnitine in Epilepsy Children, Adolescents and Young Adults Treated with Old and New Antiepileptic Drugs with or without Ketogenic Diet', Brain and Development, 28 (6), pp 358-365.

KETOCAL MAY **IMPROVE SEIZURE CONTROL AND TOLERABILITY** IN KETOGENIC DIETS FOR YOUNG CHILDREN WITH REFRACTORY EPILEPSY

Study title: Effects of a Formula-Based Ketogenic Diet on Refractory Epilepsy in 1 to 3 Year-Old Patients under Classic Ketogenic Diet

Author / Year: P Karimzadeh et al., 2019 | Study type: Randomized control trial

Study population: 45 children, aged 1-3 years with refractory epilepsy

Study Aim : To compare the efficacy and tolerability of the classic ketogenic diet (CKD) alone versus CKD with a formula-based powder (KetoCal) in young children

Key Outcomes in Patients on CKD with KetoCal powder:

50% or greater reduction in seizure frequency (p-value < 0.05)

Better response at 3 & 6mo in myoclonic seizures & infantile spasms

EEG normalization notably **higher** (p-value < 0.05)

Significant **developmental improvements**

Longer diet **adherence** suggesting **improved tolerability** (p-value < 0.05)

EEG – Electroencephalogram

Karimzadeh P et al. 2019. Effects of a Formula-Based Ketogenic Diet on Refractory Epilepsy in 1 to 3 Year-Old Patients under Classic Ketogenic Diet. Iran J Child Neurol. Autumn 2019 Vol.13 No. 4

KETOCAL 4:1 LQ

KetoCal 4:1 LQ is a ready to drink liquid available in 200ml cartons. Convenient as a supplementary drink or easily incorporated into tube feeding regimens. Can be used in all forms of KDT

FEATURES	BENEFITS
Suitable as the sole source of nutrition or for supplementary feeding	Reassuring and convenient, it minimises the need for additional supplementation
Ready to drink liquid	Convenient and practical; suitable for tube or oral feeding
Available in vanilla or unflavoured	Choice for enhanced acceptability
4:1 ratio	Peace of mind through accurate ratio and nutritional profile
Advanced fat profile	Reduces the intake of saturated fat for long-term health benefits and includes the EFAs, DHA and AA and LCPs[1-3]
Contains multifibre 6	To help meet fibre needs, as fibre intake is reduced on a KDT, and to support gut health[4,5]

NUTRITION INFORMATION

Macro-Nutrients			
Nutrients	**Unit**	**per 100ml**	**per 200ml**
Energy	kcal	150	300
	kJ	620	1240
Protein	g	3.09	6.18
Protein	% of total energy	8.2	8.2
Carbohydrate	g	0.61	1.22
sugars	g	0.39	0.78
lactose	g	0.044	0.088
Carbohydrate	% of total energy	1.6	1.6
Fat	g	14.8	29.6
saturates	g	2.2	4.4
Docosahexaenoic Acid (DHA)	mg	55	110
Fat	% of total energy	88.7	88.7
Fibre	g	1.12	2.24
Other nutrient information			
Choline	mg	51.5	103

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

EFAs - Essential Fatty Acids. DHA – Docosahexaenoic acid. AA – Amino acid. LCPs - Long chain polyunsaturated fatty acids

References:
1. Fuehrlein, B.S., Rutenberg, M.S. et al. (2004) 'Differential Metabolic Effects of Saturated Versus Polyunsaturated Fats in Ketogenic Diets', Journal of Clinical Endocrinology Metabolism, 89(4), pp. 1641-1645.
2. Dahlin M. Plasma phospholipid fatty acids are influenced by a ketogenic diet enriched with n-3 fatty acids in children with epilepsy. Epilepsy Res. 2007;73:199-207.
3. Kwiterovich P.O., Vining EPG, Pyzik P. et al. Effect of a High-Fat Ketogenic Diet on Plasma Levels of Lipids, Lipoproteins, and Apolipoproteins in Children. Journal of American.
4. Bergqvist AG. Long-term monitoring of the ketogenic diet: Do's and Don'ts. Epilepsy Res. 2012;100(3):261-6
5. Elia M., Engfer M.B. et al. (2008) 'Systematic Review and Meta-Analysis: the Clinical and Physiological Effects of Fibre-Containing Enteral Formulae' Alimentary Pharmacology Therapeutics, 27(2), pp. 120-145.

LIQUID KETOGENIC DIET IS **FEASIBLE, ENABLING RAPID KETOSIS AND NOTABLE SEIZURE REDUCTION** IN SOME PATIENTS

Study title: Ketogenic Diet in Refractory Childhood Epilepsy: Starting With a Liquid Formulation in an Outpatient Setting

Author / Year: A. Weijenberg et al., 2018 | Study type: Prospective

Study population: 16 children aged 2 to 14 years with refractory

Study Aim : To evaluate the feasibility and efficacy of introducing an all-liquid ketogenic diet (KetoCal 4:1 LQ) in an outpatient setting

Key Outcomes in Patients on KetoCal 4:1 LQ :

50% or greater reduction in seizures in **14 days**

Fast & stable induction of ketosis (mean time 7 days)

50% retention rate at 26 weeks

Liquid keto diet was **well tolerate**

Rapid assessment of **efficacy within 6 weeks**

Weijenberg A, Rijn MV, Callenbach PMC, et al. Ketogenic Diet in Refractory Childhood Epilepsy: Starting With a Liquid Formulation in an Outpatient Setting. Child Neurol Open. 2018,29(5).

KETOCAL REDUCES THE NEED TO CONSUME LARGE AMOUNTS OF DIETARY FAT – **IT PROVIDES A TASTY[1] WAY TO INCREASE FAT INTAKE**

2x cartons KetoCal 4:1

PROVIDES:

59.2g	FAT
2.4g	CARBOHYDRATE
13g	PROTEIN
400mls of fluid to help to meet requirements	FIBRE
	VITAMINS & MINERALS

25g butter

20g olive oil

50ml double cream

PROVIDES:

60g
0.7g
0.7g
Nutritional requirements not fully met solely with these foods

References:
1. Non blinded tasting survey with 107 dietitians done in 2019. Data on file.

KETOCAL 3:1 POWDER

KetoCal 3:1 is the ONLY* ketogenic formula for infants. KetoCal 3:1 is an unflavoured powder available in 300g tins. Provides complete nutritional support from birth to 3 years, or may be used as a supplementary feed for infants and children over 3 years of age.

FEATURES	BENEFITS
Suitable as the sole source of nutrition or for supplementary intakes from birth	Reassuring and convenient, it minimises the need for additional supplementation
Versatile, easy to mix powder	Ideal for tube feeding, baking and for more variety at meal times to help aid compliance
Contains carnitine	Plays an important role in energy metabolism[1] and can be deficient in patients taking certain AEDs[2]
Can be used in all forms of KDT: Classical, MCT or MKD	Suitable for patients on all forms of KDT
Advanced fat profile	Reduces the intake of saturated fat for long-term health benefits and includes the EFAs, DHA and AA and LCPs[3-5]
3:1 ratio	Peace of mind through accurate ratio and nutritional profile

NUTRITION INFORMATION

Macro-Nutrients			
Nutrients	**Unit**	**per 100g**	**per 100ml**
Energy	kcal	711	66
	kJ	2935	273
Protein	g	15.4	1.4
Carbohydrate	g	7.2	0.67
sugars	g	5.4	0.50
lactose	g	5.09	0.47
Fat	g	68.6	6.4
saturates	g	26.6	2.5
monounsaturates	g	24	2.2
polyunsaturates	g	18	1.7
Docosahexaenoic Acid (DHA)	mg	180	16.5
Fibre	g	0	0
Other nutrient information			
Choline	mg	225	20.9
Myo-inositol	mg	155	14.5

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

EFAs - Essential Fatty Acids. DHA – Docosahexaenoic acid. AA – Amino acid. LCPs - Long chain polyunsaturated fatty acids

*According to MIMS, September 2024

References:
1. Flanagan, J.L, Simmons P.A. et al. (2010) 'Role of Carnitine in Disease', Nutrition & Metabolism, 7 (30), pp 1743-1775.
2. Coppollo, G, Epifanio, G. et al. (2006) 'Plasma Free Carnitine in Epilepsy Children, Adolescents and Young Adults Treated with Old and New Antiepileptic Drugs with or without Ketogenic Diet', Brain and Development, 28 (6), pp 358-365.
3. Fuehrlein, B.S., Rutenberg, M.S. et al. (2004) 'Differential Metabolic Effects of Saturated Versus Polyunsaturated Fats in Ketogenic Diets', Journal of Clinical Endocrinology Metabolism, 89(4), pp 1641–1645.
4. Dahlin M. Plasma phospholipid fatty acids are influenced by a ketogenic diet enriched with n-3 fatty acids in children with epilepsy. Epilepsy Res. 2007;73:199–207.
4. Kwiterovich P.O., Vining EPG, Pyzik P. et al. Effect of a High-Fat Ketogenic Diet on Plasma Levels of Lipids, Lipoproteins, and Apolipoproteins in Children. Journal of American.

KETOCAL 2.5:1 LQ

KetoCal 2.5:1 LQ is a vanilla flavoured ready to drink liquid available in 200ml cartons. Convenient as a supplementary drink or easily incorporated into tube feeding regimens.

ONLY* ketogenic formula specifically designed to meet protein requirements of teens and adults

FEATURES	BENEFITS
Suitable as the sole source of nutrition or for supplementary feeding	Reassuring and convenient, it minimises the need for additional supplementation
Ready to drink liquid	Convenient and practical; suitable for tube or oral feeding
2.5:1 ratio	Peace of mind through accurate ratio and nutritional profile
Advanced fat profile	May help keep lipid profile within the normal range[1-3]
Contains multifibre 6	To help meet fibre needs, as fibre intake is reduced on a KDT, and to support gut health[4,5]
Can be used in all forms of KDT: Classical, MCT or MKD	Suitable for patients on all forms of KDT

NUTRITION INFORMATION

AVERAGE CONTENTS	Unit	per 100ml	per 200ml
Energy	kcal	153	306
	kJ	637	1274
Protein	g	4.5	9.0
% of total energy	%	12	12
Carbohydrates	g	1.1	2.2
sugars	g	0.8	1.6
lactose	g	0.11	0.22
% of total energy	%	3	3
Fat	g	14.3	28.6
saturates	g	4.8	9.6
monounsaturates	g	8.0	16.0
polyunsaturates	g	1.5	3.0
Medium chain triglycerides	g	3.6	7.2
Docosahexaenoic acid (DHA)	mg	58	116
Arachidonic acid (AA)	mg	-	-
LCT	%	74.4	74.4
MCT	%	25.6	25.6
% of total energy	%	84	84
Fibre	g	1.1	2.2
soluble	g	0.56	1.1
insoluble	g	0.56	1.1
% of total energy	%	1	1

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

*According to MIMS, September 2024

References:
1. Fuehrlein, B.S., Rutenberg, M.S. et al. (2004) 'Differential Metabolic Effects of Saturated Versus Polyunsaturated Fats in Ketogenic Diets', Journal of Clinical Endocrinology Metabolism, 89(4), pp. 1641–1645.
2. Dahlin M. Plasma phospholipid fatty acids are influenced by a ketogenic diet enriched with n-3 fatty acids in children with epilepsy. Epilepsy Res. 2007;73:199–207.
3. Kwiterovich P.O., Vining EPG, Pyzik P. et al. Effect of a High-Fat Ketogenic Diet on Plasma Levels of Lipids, Lipoproteins, and Apolipoproteins in Children. Journal of American.
4. Bergqvist AG. Long-term monitoring of the ketogenic diet: Do's and Don'ts. Epilepsy Res. 2012;100(3):261–6
5. Elia M., Engfer M.B. et al. (2008) 'Systematic Review and Meta-Analysis: the Clinical and Physiological Effects of Fibre-Containing Enteral Formulae' Alimentary Pharmacology Therapeutics, 27(2), pp. 120–145.

LOWER SATURATED FAT

All KetoCal products have lower saturated fat than typical high fat foods, like double cream[1]

KetoCal 4:1

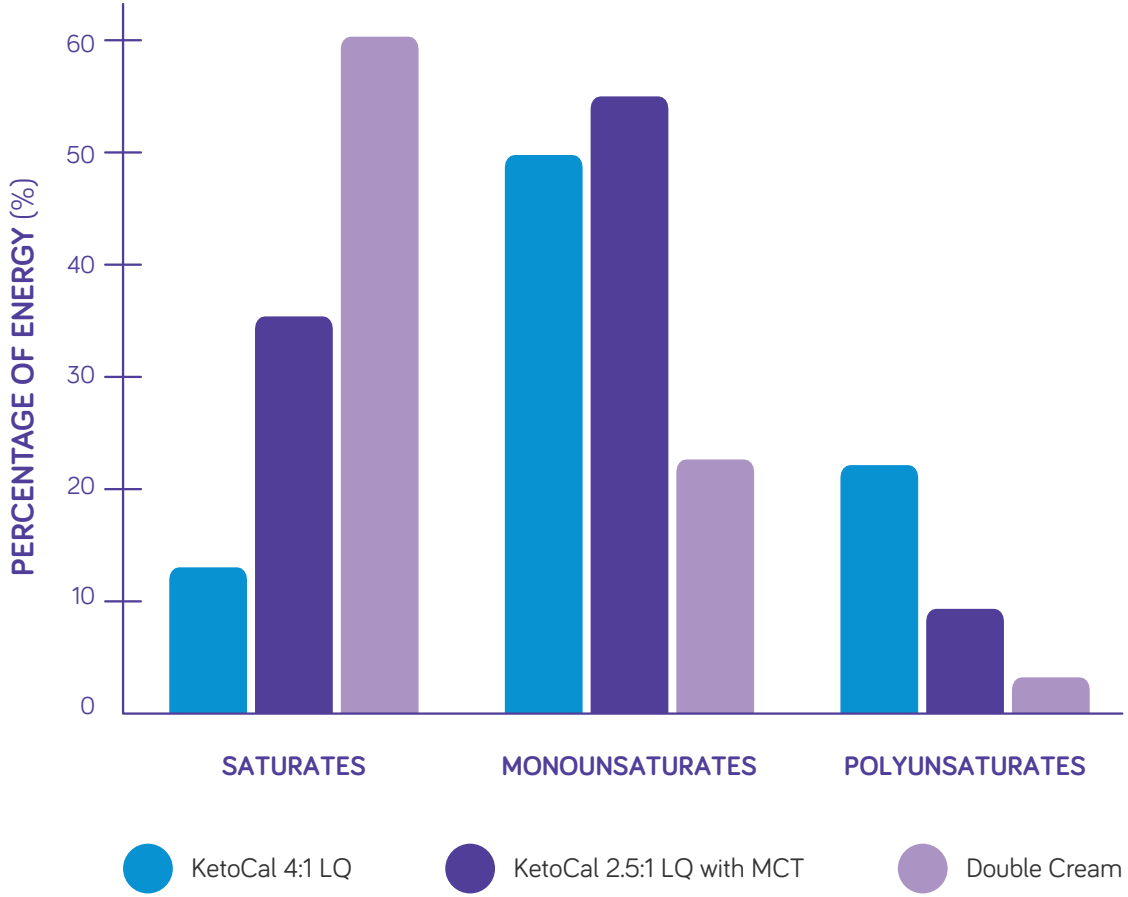
13%

of energy from saturates

KetoCal 2.5:1

35%

of energy from saturates



References:
1. https://www.gov.uk/government/publications/composition-of-foods-integrated-dataset-cofid. Accessed September 2024.

MCT OIL

A nutritionally incomplete unflavoured liquid that consists of 100% Medium Chain Triglycerides (MCT) and can be used as part of a ketogenic diet.

FEATURES	BENEFITS
500ml resealable plastic bottles	Convenient for every day use
100% MCT fat emulsion	Low volume needed to meet requirements
Can be used as part of a modular feed	Adaptable for use with tube fed patients
Suitable for cooking	More variety at meal times to aid compliance (see our great range of recipe books)
Can be used in all forms of KDT: Classical, MCT or MKD	Suitable for patients on all forms of KDT
Suitable for all ages	Reassuring and convenient

NUTRITION INFORMATION		
AVERAGE CONTENTS	Unit	per 100ml
Energy	kcal	855
	kJ	3515
Protein	g	0
Carbohydrates	g	0
Fat	g	95
Saturates	g	95
% MCT	%	100

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

LIQUIGEN

A nutritionally incomplete unflavoured liquid that consists of 50% Medium Chain Triglycerides (MCT) emulsion and can be used as a part of a ketogenic diet.

FEATURES	BENEFITS
250ml resealable plastic bottles	No wastage and doses can be varied to build up tolerance
50% MCT fat emulsion	Low volume needed to meet requirements
Suitable for all ages	Reassuring and convenient
Can be easily flavoured	Helps aid compliance
Can be used as part of a modular feed	Adaptable for using with tube feed patients
Can be used as a milk substitute or as a cooking ingredient	Versatile and can be used in a range of ketogenic diets

NUTRITION INFORMATION			
AVERAGE CONTENTS	Unit	per 100ml	per 250ml
Energy	kcal	454	1135
	kJ	1865	4663
Protein	g	nil added	nil added
Carbohydrates	g	nil added	nil added
Fat	g	50.4	126
Saturates	g	50.4	126
of which MCT	g	49.1	122.75

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

PHLEXY-VITS

An unflavoured powder that provides vitamins, minerals and trace elements to help support ketogenic patients in achieving adequate micronutrient intake.

FEATURES	BENEFITS
Contains vitamins, minerals and trace elements	1 sachet can help meet the micronutrient needs of patients aged 11 and older. Powder can be measured to meet the needs of younger children
7g dose sachets or tablets	Flexible formats for added convenience and adaptable to individual needs
0.5g carbohydrate per 100g	Low in carbohydrate for patients following a ketogenic diet

NUTRITION INFORMATION

AVERAGE CONTENTS	Unit	per 100g	per Sachet (7g)
Energy	kcal	15	1
	KJ	63	4
Protein	g	0.3	0.02
Carbohydrate	g	0.5	0.04
sugars	g	0.5	0.04
Fat	g	nil added	nil added
saturates	g	nil added	nil added
Minerals			
sodium	mg (mmol)	125 (5.4)	8.8 (0.4)
potassium	mg (mmol)	<20 (<0.5)	<1.4 (<0.04)
chloride	mg (mmol)	<5 (<0.1)	<0.35 (<0.01)
calcium	mg (mmol)	14286 (357)	1000 (25)
phosphorus	mg (mmol)	11072 (357)	775 (25)
magnesium	mg (mmol)	4286 (179)	300(12.3)
iron	mg	215	15
zinc	mg	158	11
copper	µg	21500	1505
manganese	mg	21.5	1.5
molybdenum	µg	1000	70
selenium	µg	1072	75
chromium	µg	429	30
iodine	µg	2143	150
Vitamins			
vitamin A	µg	11430	800
vitamin D	µg	143	10
vitamin E	mg (mg α-TE)	192.3(129)	13.5(9)
vitamin K	µg	1000	70
thiamin	mg	17.1	1.2
riboflavin	mg	20	1.4
niacin	mg NE	286	20
pantothenic acid	mg	71.5	5
vitamin B6	mg	22.9	1.6
folic acid	µg	10000	700
vitamin B12	µg	71.5	5
biotin	µg	2143	150
vitamin C	mg	715	50

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

CALOGEN

A high energy Long Chain Triglycerides (LCT) fat emulsion that can be used as part of a ketogenic diet.

FEATURES	BENEFITS
0.1g carbohydrate per 100ml*	Low carbohydrate for suitability of use with ketogenic patients
Available in 200ml and 500ml presentations	Flexible presentations for convenience
Suitable for use from birth	Reassurance that ketogenic patients of any age can use Calogen neutral
Ready to feed liquid	Can be used as a milk substitute, cookery ingredient or added to modular feeds for tube feeding
50% LCT emulsion	LCT requirements can be met in a low volume

NUTRITION INFORMATION

AVERAGE CONTENTS	Unit	per 100ml
Energy	kcal	450
	kJ	1850
Protein	g	0
Carbohydrate	g	0.1
Sugars	g	0
Fat	g	50
Saturates	g	5.3
Monounsaturates	g	30.4
Polyunsaturates	g	14.3
% LCT	%	100

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

*Neutral flavour only

PROTIFAR

High protein powder

FEATURES	BENEFITS
A high source of protein	Enables ketogenic patients to meet protein requirements in small volumes
Versatile easy to mix powder, low in carbohydrate	Can be added to ketogenic recipes to increase protein content whilst providing minimal carbohydrate
Neutral flavour	Can be used as an ingredient in ketogenic meals or feeds without altering the taste
Can be used as part of a modular feed	Adaptable for using with tube fed patients
Suitable for use with patients 3 years and above	Reassurance that protein requirements for ketogenic patients 3 years and above can be met

NUTRITION INFORMATION			
AVERAGE CONTENTS	Unit	per 100ml	per 250ml
Energy	kcal	368	9
	KJ	1560	39
Protein	g	87.2	2.2
Carbohydrate	g	1.5	0.04
Sugars	g	<1.5	<0.04
Lactose	g	<1.5	<0.04
Fat	g	1.6	0.04
Saturates	g	1.2	0.03
Fibre	g	0	0

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

MAXIJUL

A powdered carbohydrate energy source which can be mixed.

FEATURES	BENEFITS
Source of carbohydrate	Easily adapt ratios of ketogenic meals or tube feeds
Available in 200g tins and 132g sachets	Flexible presentations for convenience
Neutral flavour	Can be used as an ingredient in ketogenic meals or feeds without altering the taste
Versatile, easy to mix, powder	Add to sweet or savoury food and liquids and suitable for baking, boiling or freezing
Can be used as part of a modular feed	Adaptable for using with tube fed patients
Suitable for use from birth	Reassurance that ketogenic patients of any age can use Maxijul

NUTRITION INFORMATION			
AVERAGE CONTENTS	Unit	per 100ml	per 250ml
Energy	kcal	380	125
	KJ	1615	533
Protein	g	0	0
Carbohydrate	g	95	31.4
Sugars	g	8.6	8.6
Fat	g	0	0
Fibre	g	0	0

Only selected nutrients are shown. Please refer to the product label or Nutricia Dietetic App for further nutritional information.

WHAT PATIENTS SAY ABOUT KETOCAL

We travel often, and KetoCal 4:1 LQ is easy to pack and take anywhere! Coco has been on the ketogenic diet for 6 years now, and KetoCal has been an invaluable aide every step of the way.

Shelly & John about their daughter Colleen (8 years old)
USA

My dietitian helped me obtain the KetoCal 4:1 LQ formula to reduce the stress of meal planning since I was attending work, school, and the swim team. For the first time since my seizures began, I went two months seizure-free.

Hailey, a patient's story
USA

We started out slowly by using her formula mixed with KetoCal® 4:1 powder. Then we kept adding more KetoCal® while decreasing the other formula until she was getting all KetoCal… I started noticing a decrease in seizures.

Leah, a patient's story
USA

RESOURCES FOR YOUR PATIENTS

NUTRICIA
MyKetoPlanner

The meal planning tool that offers flexibility and variety for the ketogenic community

A free web-based platform for the ketogenic community to find, calculate, create and share ketogenic diet recipe ideas.

MyKetoPlanner has 1000's of recipes suitable for all types of Ketogenic diets.

Our specialist chef adds new recipes every week!

Nutricia Homeward Metabolics and Specialist

Nutricia Homeward Metabolics & Specialist is a free home delivery service available across the UK. There are no tie-ins and no minimum contract.

- Dedicated patient coordinator team
- Giving your patients / carers more control over their deliveries

KETOCAL **PRODUCT SELECTION GUIDE**

TUBE FED PATIENT / ORALLY FED PATIENT
SOLE SOURCE OF NUTRITION
IN ADDITION TO REGULAR KETO-FRIENDLY FOOD

FAMILY PREFERS POWDER FOR COMPACT STORAGE AND TRANSPORTATION

FAMILY OR PATIENT PREFERS CONVENIENCE OF READY-TO-FEED FORMULA

3:1 RATIO
from birth

4:1 RATIO
1+ years

2.5:1 RATIO
8+ years

MODIFIED ATKINS DIET
(MAD)

KETOCAL 3:1 POWDER

KETOCAL 4:1 POWDER

KETOCAL 4:1 LQ (LIQUID)

KETOCAL 2.5:1 LQ (LIQUID) **WITH MCT**

FAMILY AND PATIENTS WHO WANT TO USE KETOCAL TO MAKE RECIPES

RATIO CAN BE ADAPTED FOR EACH RECIPE

SAVORY RECIPES
(SOUP, PIZZA, WRAPS)

KETOCAL POWDER OR LIQUID

SWEET RECIPES
(CAKES, COOKIES, MUFFINS, SMOOTHIES)

KETOCAL POWDER OR LIQUID

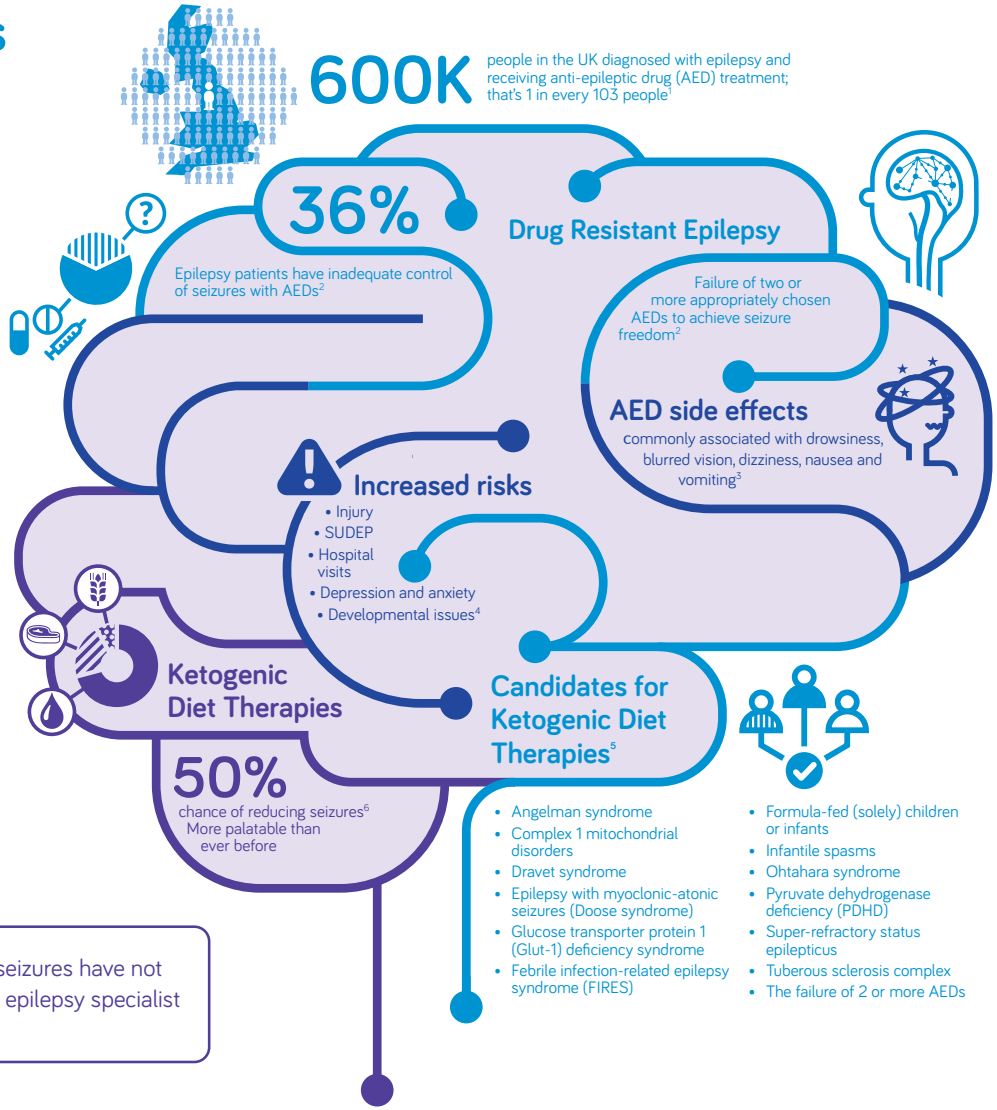
KetoCal intake to be determined by a medical professional and is dependent on the age, weight, energy needs and medical condition of the individual. See the product description for age indication per product.

KetoCal full portfolio can be used for all forms of KDT

Supplemental MCT oil or Liquigen can be used to boost ketosis

DRUG RESISTANT EPILEPSY

Medication is not always the answer



NICE National Institute for Health and Care Excellence

Refer children and young people with epilepsy whose seizures have not responded to appropriate AEDs to a tertiary paediatric epilepsy specialist for consideration of the use of a ketogenic diet[7]

References:

1. Joint Epilepsy Council (2011) 'Epilepsy Prevalence, Incidence and Other Statistics', Available at: http://www.jointepilepsycouncil.org.uk/ (Accessed: September 2024)
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3. Epilepsy Foundation (2018) 'Risks with Epilepsy', Available at: https://www.epilepsysociety.org.uk/risks-epilepsy#.W6DyWehKjIU (Accessed: September 2024)
4. Epilepsy Society (2018) 'Risks with Epilepsy', Available at: https://www.epilepsysociety.org.uk/risks-epilepsy#.W6DyWehKjIU (Accessed: September 2024)
5. Kossoff, E. et al., 2018 'Optimal Clinical Management of Children Receiving Dietary Therapies for Epilepsy: Updated Recommendations of the International Ketogenic Diet Study Group'. Epilepsia Open: 1-18
6. Martin K et al. Cochrane Database of Systematic Reviews 2016:CD001903.pub3
7. NICE Epilespsies in children, young people and adults. Clinical Guideline [ng217] Published April 2022