

AUSTRALIAN PRODUCT INFORMATION - SMOFKABIVEN® (AMINO ACIDS 5.1%, LIPIDS 3.8%, GLUCOSE 12.7% & ELECTROLYTES 0.7%)

1 NAME OF MEDICINE

Amino Acids 5.1%

Alanine, Arginine, Glycine, Histidine, Isoleucine, Leucine, Lysine acetate, Methionine, Phenylalanine, Proline, Serine, Taurine, Threonine, Tryptophan, Tyrosine, Valine

Lipids 3.8%

Soya oil
Fish oil - rich in Omega-3 acids
Medium chain triglycerides
Olive oil

Glucose 12.7%

Glucose monohydrate

Electrolytes 0.7%

Calcium chloride dihydrate
Magnesium sulfate heptahydrate
Potassium chloride
Sodium acetate trihydrate
Sodium glycerophosphate hydrate
Zinc sulfate heptahydrate

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

SmofKabiven is a three chamber bag system of amino acid solution with electrolytes, glucose solution and lipid emulsion for intravenous infusion.

Each bag contains the following partial volumes depending on the four pack sizes.

	986 mL	1477 mL	1970 mL	2463 mL	Per 1000 mL
Amino acid solution with electrolytes (mL)	500	750	1000	1250	508
Glucose 42% (mL)	298	446	595	744	302
Lipid emulsion (mL)	188	281	375	469	190

This corresponds to the following total compositions:

Active ingredients (g)	986 mL	1477mL	1970 mL	2463 mL	Per 1000 mL
Alanine	7.0	10.5	14.0	17.5	7.1
Arginine	6.0	9.0	12.0	15.0	6.1
Glycine	5.5	8.2	11.0	13.8	5.6
Histidine	1.5	2.2	3.0	3.7	1.5
Isoleucine	2.5	3.8	5.0	6.2	2.5
Leucine	3.7	5.6	7.4	9.4	3.8
Lysine acetate <i>corresponding to Lysine</i>	3.3	5.0	6.6	8.4	3.4
Methionine	2.2	3.2	4.3	5.4	2.2
Phenylalanine	2.6	3.8	5.1	6.4	2.6
Proline	5.6	8.4	11.2	14.0	5.7

Active ingredients (g)	986 mL	1477mL	1970 mL	2463 mL	Per 1000 mL
Serine	3.2	4.9	6.5	8.1	3.3
Taurine	0.50	0.75	1.0	1.2	0.50
Threonine	2.2	3.3	4.4	5.4	2.2
Tryptophan	1.0	1.5	2.0	2.5	1.0
Tyrosine	0.20	0.30	0.40	0.49	0.20
Valine	3.1	4.6	6.2	7.6	3.1
Calcium chloride dihydrate <i>corresponding to</i> Calcium chloride	0.28	0.42	0.56	0.69	0.28
Sodium glycerophosphate hydrate <i>corresponding to</i> Sodium glycerophosphate	2.1	3.1	4.2	5.2	2.1
Magnesium sulfate heptahydrate <i>corresponding to</i> Magnesium sulfate	0.60	0.90	1.2	1.5	0.61
Potassium chloride	2.2	3.4	4.5	5.7	2.3
Sodium acetate trihydrate <i>corresponding to</i> Sodium acetate	1.7	2.6	3.4	4.2	1.7
Zinc sulfate heptahydrate <i>corresponding to</i> Zinc sulfate	0.0065	0.0097	0.013	0.016	0.0066
Glucose monohydrate <i>corresponding to</i> Glycose (anhydrous)	125	187	250	313	127
Soya oil	11.3	16.9	22.5	28.1	11.4
Medium chain triglycerides	11.3	16.9	22.5	28.1	11.4
Olive oil	9.4	14.1	18.8	23.4	9.5
Fish oil - rich in Omega-3 acids	5.6	8.4	11.3	14.0	5.7

Corresponding to:

	986 mL	1477 mL	1970 mL	2463 mL	Per 1000 mL
• Amino acids (g)	50	75	100	125	51
• Nitrogen (g)	8	12	16	20	8
• Lipids (g)	38	56	75	94	38
• Carbohydrates – Glucose (anhydrous) (g)	125	187	250	313	127
• Electrolytes (mmol)					
- sodium	40	60	80	100	41
- potassium	30	45	60	74	30
- magnesium	5.0	7.5	10	12	5.1
- calcium	2.5	3.8	5.0	6.2	2.5
- phosphate ¹	12	19	25	31	13
- zinc	0.04	0.06	0.08	0.1	0.04
- sulfate	5.0	7.5	10	13	5.1
- chloride	35	52	70	89	36
- acetate	104	157	209	261	106

	986 mL	1477 mL	1970 mL	2463 mL	Per 1000 mL
• Energy content					
- total (approx.)	1100 kcal 4600 kJ	1600 kcal 6700 kJ	2200 kcal 9200 kJ	2700 kcal 11300 kJ	
- non-protein (approx.)	900 kcal 3800 kJ	1300 kcal 5400 kJ	1800kcal 7500 kJ	2200 kcal 9200 kJ	
- glucose (approx.) ²	520 kcal 2200 kJ	770 kcal 3200 kJ	1040 kcal 4400 kJ	1290 kcal 5400 kJ	
- lipid (approx.) ³	380 kcal 1600 kJ	530 kcal 2200 kJ	760 kcal 3200 kJ	910 kcal 3800 kJ	
- glucose/lipid ratio	58/42	58/42	58/42	58/42	
- protein (g) ⁴ /energy kcal ratio	1.5/32	1.5/32	1.5/32	1.5/32	

¹ Contribution from both the lipid emulsion and the amino acid solution.

² Includes calories from glycerol

³ Includes calories from egg lecithin (phospholipids)

⁴ In the form of amino acids

Excipients with known effect: Egg lecithin

For the full list of excipients, see Section 6.1 List of excipients.

3 PHARMACEUTICAL FORM

Emulsion for intravenous infusion.

Glucose and amino acid solutions are clear and colourless to slightly yellow solution and free from particles.

The lipid emulsion is white and homogenous.

Osmolality: approx. 1800 mOsm/kg water

Osmolarity: approx. 1500 mOsm/L

pH (after mixing): approx. 5.6

4 CLINICAL PARTICULARS

4.1 Therapeutic indications

Parenteral nutrition for adult patients and paediatric patients aged 2 years and above when oral or enteral nutrition is impossible, insufficient or contraindicated.

4.2 Dose and method of administration

Dosage (dose and interval)

The appearance of the product after mixing the three chambers is a white, homogenous emulsion.

The patient's ability to eliminate fat and metabolise nitrogen and glucose, and the nutritional requirements should govern the dosage and infusion rate, see section 4.4 Special warnings and precautions for use.

The dose should be individualised with regard to the patient's clinical condition, body weight (bw), nutritional and energy requirements, adjusting dosage based upon additional oral/enteral intake.

The nitrogen requirements for maintenance of body protein mass depend on the patient's condition (e.g. nutritional state and degree of catabolic stress or anabolism).

As part of routine assessment, the clinician should assess the dosage infused and make adjustment if long term use is being considered especially regarding zinc levels.

Additives

SmofKabiven may not cover sufficiently the total nutrient requirements of paediatric patients and in such cases macro- and/or micronutrients should be provided in addition, as appropriate and at the discretion of the physician.

The contents of the three separate chambers have to be mixed before any additions are made via the additive port.

Any additions should be made aseptically.

Adults

The requirements are 0.10-0.15 g nitrogen/kg bw/day (0.6-0.9 g amino acids/kg bw/day) in the normal nutritional state or in conditions with mild catabolic stress. In patients with moderate to high metabolic stress with or without malnutrition, the requirements are in the range of 0.15-0.25 g nitrogen/kg bw/day (0.9-1.6 g amino acids/kg bw/day). In some very special conditions (e.g. burns or marked anabolism) the nitrogen need may be even higher.

Dosage

The dosage range of 13 mL – 31 mL SmofKabiven/kg bw/day corresponds to 0.10-0.25 g nitrogen/kg bw/day (0.6-1.6 g amino acids/kg bw/day) and 14-35 kcal/kg bw/day of total energy (12-27 kcal/kg bw/day of non-protein energy). This covers the need of the majority of the patients. In obese patients the dose should be based on the estimated ideal body weight.

Infusion rate

The maximum infusion rate for glucose is 0.25 g/kg bw/h, for amino acid 0.1 g/kg bw/h, and for fat 0.15 g/kg bw/h.

The infusion rate should not exceed 2.0 mL/kg bw/h (corresponding to 0.25 g glucose, 0.10 g amino acids, and 0.08 g fat/kg bw/h). The recommended infusion period is 14-24 hours.

Maximum daily dose

The maximum daily dose varies with the clinical condition of the patient and may even change from day to day. The recommended maximum daily dose is 35 mL/kg bw/day.

The recommended maximum daily dose of 35 mL/kg bw/day will provide 0.28 g nitrogen/kg bw/day (corresponding to 1.8 g amino acids/kg bw/day), 4.5 g glucose/kg bw/day, 1.33 g fat/kg bw/day and a total energy of 39 kcal/kg bw/day (corresponding to 31 kcal/kg bw/day of non-protein energy).

Paediatric population

Children (2-11 years)

Dosage:

The dose up to 35 mL/kg bw/day should be regularly adjusted to the requirements of the paediatric patient that varies more than in adult patients.

Infusion rate:

The recommended maximum infusion rate is 2.4 mL/kg bw/h (corresponding to 0.12 g amino acids/kg/h, 0.30 g/glucose/kg/h and 0.09 g lipids/kg/h). At the recommended maximum infusion rate, do not use an infusion period longer than 14 hours 30 minutes, except in exceptional cases and with careful monitoring.

The recommended infusion period is 12-24 hours.

Maximum daily dose:

The maximum daily dose varies with the clinical condition of the patient and may even change from day to day. The recommended maximum daily dose is 35 mL/kg bw/day.

The recommended maximum daily dose of 35 mL/kg bw/day will provide 1.8 g amino acids/kg/bw/day (corresponding to 0.28 g nitrogen/kg bw/day), 4.5 g glucose/kg bw/day, 1.33 g lipids/kg/bw/day and a total energy content of 39 kcal/kg bw/day (corresponding to 31 kcal/kg bw/day of non-protein energy).

Adolescents (12-18 years)

In adolescents, SmofKabiven can be used as in adults.

Method of administration

Intravenous, infusion into a central vein.

The use in paediatric patients should be supported by monitoring following the most current expert nutrition support guidelines prepared by the treating hospital or by expert groups such as the American Society of Parenteral and Enteral Nutrition (ASPEN) or the European Society of Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) and the European Society for Clinical Nutrition and Metabolism (ESPEN), supported by the European Society of Paediatric Research (ESPR).

The four different package sizes of SmofKabiven are intended for patients with high, moderately increased or basal nutritional requirements. To provide total parenteral nutrition, trace elements, vitamins and possibly electrolytes (taking into account the electrolytes already present in SmofKabiven) should be added to SmofKabiven according to the patient's need.

For instructions on preparation of the medicinal product before administration, see section 6.4 Special precautions for storage.

Compatibility

Compatibility data are available with the named branded products Addaven, Vamin 18EF, Glycophos, Vitalipid N Adult/Infant and Soluvit N in defined amounts and generics of electrolytes in defined concentrations. When making electrolyte additions, the amounts already present in the bag should be taken into account to meet the clinical needs of the patient. Generated data supports additions to the activated bag according to the summary table below:

	Maximal total contents
SmofKabiven bag size	986 mL
Additive	Volume
Vamin 18 EF	0 - 330 mL
Addaven	0 - 10 mL
Soluvit N	0 - 1 vial

	Maximal total contents
Vitalipid N Adult or Vitalipid N Infant	0 - 10 mL
Electrolyte limits¹	Amount per bag
Sodium	≤ 150 mmol
Potassium	≤ 150 mmol
Calcium	≤ 5 mmol
Magnesium	≤ 5 mmol
Phosphate inorganic ²	≤ 15 mmol
Zinc	≤ 0.2 mmol
Selenium	≤ 1 µmol

¹ Includes amounts from all products. Electrolyte additions may be scaled up for other bag sizes.

² The same limits are valid when additions of organic phosphate (i.e. Glycophos) are used.

Note: This table is intended to present compatibility. It is not a dosing guideline.

4.3 Contraindications

- Hypersensitivity to fish-, egg-, soya- or peanut protein or corn (maize) and corn products or to any of the active substances or excipients
- Severe hyperlipidaemia
- Severe liver insufficiency
- Severe blood coagulation disorders
- Congenital errors of amino acid metabolism
- Severe renal insufficiency without access to hemofiltration or dialysis
- Acute shock
- Uncontrolled hyperglycaemia
- Pathologically elevated serum levels of any of the included electrolytes
- General contraindications to infusion therapy: acute pulmonary oedema, hyperhydration, and decompensated cardiac insufficiency
- Haemophagocytotic syndrome
- Unstable conditions (e.g. severe post-traumatic conditions, uncompensated diabetes mellitus, acute myocardial infarction, stroke, embolism, metabolic acidosis, severe sepsis, hypotonic dehydration and hyperosmolar coma)
- Infants and children under 2 years of age

4.4 Special warnings and precautions for use

The capacity to eliminate fat is individual and should therefore be monitored according to the routines of the clinician. This is in general done by checking the triglyceride levels. The concentration of triglycerides in serum should not exceed 3 mmol/L during infusion. An overdose may lead to fat overload syndrome. (Please also refer to “Fat overload syndrome”).

SmofKabiven should be given with caution in conditions of impaired lipid metabolism, which may occur in patients with renal failure, diabetes mellitus, pancreatitis, impaired liver function, hypothyroidism and sepsis.

This medicinal product contains soya oil, fish oil, and egg phospholipids which may rarely cause allergic reactions. This applies also to corn (maize) and corn that may be contained in the medicine as small amounts of impurities. Cross allergic reaction has been observed between soybean, and peanut.

To avoid risks associated with too rapid infusion rates, it is recommended to use a continuous and well-controlled infusion, if possible by using an appropriate infusion pump as per each hospital setting needs, e.g. a volumetric pump.

Since an increased risk of infection is associated with the use of any central vein, strict aseptic precautions should be taken to avoid any contamination during catheter insertion and manipulation.

Disturbances of the electrolyte and fluid balance (e.g. abnormally high or low serum levels of the electrolytes) should be corrected before starting the infusion.

SmofKabiven should be given with caution to patients with a tendency towards electrolyte retention. Special clinical monitoring is required at the beginning of any intravenous infusion. Should any abnormal sign occur, the infusion must be discontinued.

The monitoring of serum glucose, electrolytes, and osmolarity as well as fluid balance, acid-base status, and liver enzyme tests is recommended.

Blood cell count and coagulation should be monitored when fat is given for a longer period.

In patients with renal insufficiency, the phosphate and potassium intake should be carefully controlled to prevent hyperphosphataemia and hyperkalaemia.

The amount of individual electrolytes to be added is governed by the clinical condition of the patient and by frequent monitoring of serum levels.

Parenteral nutrition should be given with caution in lactic acidosis, insufficient cellular oxygen supply, and increased serum osmolarity.

The infusion should be stopped immediately at any sign or symptom of anaphylactic reaction (such as fever, shivering, rash, or dyspnoea).

Intravenous infusion of amino acids is accompanied by increased urinary excretion of the trace elements, in particular copper and zinc. This should be considered in the dosing of trace elements, especially during long-term intravenous nutrition. Amounts of zinc administered with SmofKabiven should be taken into account.

In malnourished patients, initiation of parenteral nutrition can precipitate fluid shifts resulting in pulmonary oedema and congestive heart failure as well as a decrease in the serum concentration of potassium, phosphorus, magnesium, and water soluble vitamins. These changes can occur within 24 to 48 hours, therefore, careful and slow initiation of parenteral nutrition is recommended in this patient group, together with close monitoring and appropriate adjustments of fluid, electrolytes, minerals, and vitamins.

SmofKabiven should not be given simultaneously with blood in the same infusion set due to the risk of pseudo-agglutination.

In patients with hyperglycaemia, administration of exogenous insulin might be necessary.

Amino acid solutions may cause acute folate deficiency; folic acid should therefore be given daily.

Vitamin B complex deficiency may occur with glucose administration.

Review of current available literature associated with Parenteral Nutrition Associated Liver Dysfunction (PNALD) shows emerging evidence indicating that fish oil-based lipid emulsions improve liver function within the scope of PN in general and may have the potential to reverse PNALD in children with short bowel syndrome.

Excessive exposure to light and UV light should be avoided as peroxide formation may occur.

Fat overload syndrome

Impaired capacity to eliminate triglycerides can lead to "Fat overload syndrome" which may be caused by overdose. Patients should be monitored for possible signs of metabolic overload. The cause may be genetic (individually different metabolism) or the fat metabolism may be affected by ongoing or previous illnesses. This syndrome may also appear during severe hypertriglyceridaemia, even at the recommended infusion rate, and in association with a sudden change in the patient's clinical condition, such as renal function impairment or infection. Fat overload syndrome is characterised by hyperlipidaemia, fever, fat infiltration, hepatomegaly with or without icterus, splenomegaly, anaemia, leukopaenia, thrombocytopaenia, coagulation disorder, haemolysis and reticulocytosis, abnormal liver function tests and coma. The symptoms are usually reversible if the infusion of the fat emulsion is discontinued. Should signs of a fat overload syndrome occur, the infusion of SmofKabiven should be discontinued.

Excess of amino acid infusion

As with other amino acid solutions, the amino acid content in SmofKabiven may cause undesirable effects when the recommended infusion rate is exceeded. These effects are nausea, vomiting, shivering and sweating. Amino acid infusion may also cause a rise in body temperature. With an impaired renal function, increased levels of nitrogen containing metabolites (e.g. creatinine, urea) may occur.

Excess of glucose infusion

If the glucose clearance capacity of the patient is exceeded, hyperglycaemia will develop.

Use in hepatic impairment

No data available.

Use in renal impairment

No data available.

Use in the elderly

No data available.

Paediatric use

Due to the composition of the amino acid solution in SmofKabiven it is not suitable for use in neonates and infants below 2 years of age. There is at present no clinical trial conducted on the use of SmofKabiven in children (age 2 years to 11 years).

Effects on laboratory tests

The fat content of SmofKabiven may interfere with certain laboratory measurements (e.g. bilirubin, lactate dehydrogenase, oxygen saturation, haemoglobin) if blood is sampled before fat has been adequately cleared from the bloodstream. Fat is cleared after a fat-free interval of 5-6 hours in most patients.

4.5 Interaction with other medicines and other forms of interactions

Some medicinal products, like insulin, may interfere with the body's lipase system. This kind of interaction seems, however, to be of limited clinical importance.

Heparin given in clinical doses causes a transient release of lipoprotein lipase into the circulation. This may result initially in increased plasma lipolysis followed by a transient decrease in triglyceride clearance.

Soya oil has a natural content of vitamin K₁. However, the concentration in SmofKabiven is so low that it is not expected to significantly influence the coagulation process in patients treated with coumarin derivatives.

4.6 Fertility, pregnancy and lactation

Effects on fertility

The potential effects of SmofKabiven on fertility and general reproductive performance have not been determined in animal studies.

Use in pregnancy

As with all parenteral nutrition products, SmofKabiven is exempt from pregnancy categorisation.

There are no adequate and well-controlled studies in pregnant women with SmofKabiven or its individual components; therefore, the safety of SmofKabiven in pregnant women is not known.

No animal studies have been conducted with the combined lipid components of SmofKabiven to evaluate effects on reproduction. Embryotoxicity and increased incidences of foetal skeletal variations have been observed in rabbits that had received medium chain fatty acid-containing lipids similar to those in SmofKabiven during the period of organogenesis. SmofKabiven should not be used during pregnancy unless the expected therapeutic benefit clearly outweighs the potential risk to the foetus.

Use in lactation

It is not known whether SmofKabiven can enter maternal milk. As zinc is excreted in milk, there is a theoretical risk of zinc-induced copper deficiency in the infant at high doses of SmofKabiven. SmofKabiven should be used during lactation only if clearly needed.

4.7 Effects on ability to drive and use machines

The effects of this medicine on a person's ability to drive and use machines were not assessed as part of its registration.

4.8 Adverse effects (Undesirable effects)

Adverse events with at least possible relationship to the study drug observed in the study 03-3CB7-001 with SmofKabiven are presented in Table 1 below.

Table 1. Adverse events with at least possible relationship to the study drug in the study 03-3CB7-001

Adverse events sorted according to the relationship to study drug n (%) of patients		Treatment group	
		SmofKabiven (n=26)	Comparator (n=27)
Probable	Subjects with remarks	1 (3.8)	-
	Nausea	1 (3.8)	-
Possible	Subjects with remarks	16 (61.5)	11 (40.7)
	Nausea	4 (15.4)	7 (25.9)
	Vomiting NOS	7 (26.9)	2 (7.4)
	Flatulence	4 (15.4)	1 (3.7)
	Abdominal Pain NOS	-	1 (3.7)
	Hypertension NOS	1 (3.8)	-

	Oedema NOS	1 (3.8)	-
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NOS: Not otherwise specified. The study was performed in patients with mainly gastric or colon cancers and existing gastrointestinal disorders and elevated CRP in all subjects before inclusion in the study.

Drug-related adverse events have been reported from 7 clinical studies with the separate components of SmofKabiven, SMOFlipid 20% and Aminoven 10%.

Table 2 below lists the common drug-related Treatment-Emergent Adverse Events (TEAEs) occurring in more than 2 patients in SMOFlipid 20% group versus comparator pooled groups.

Table 2. Drug-related TEAEs in SMOFlipid 20% and comparator pooled groups observed in 7 clinical trials

Drug-related TEAEs n (%) of patients	Treatment group	
	SMOFlipid 20% pooled (n=282)	Comparator pooled (n=276)
Number of patients with at least 1 drug-related TEAE	45 (16.0)	43 (15.6)
Nausea	12 (4.3)	13 (4.7)
Vomiting	12 (4.3)	6 (2.2)
Blood triglycerides increased	6 (2.1)	3 (1.1)
Hyperglycaemia	5 (1.8)	3 (1.1)
Hyperbilirubinaemia	4 (1.4)	5 (1.8)
Flatulence	4 (1.4)	1 (0.4)
Liver function test abnormal	2 (0.7)	3 (1.1)
Hypertriglyceridaemia	2 (0.7)	3 (1.1)
Gamma-glutamyltransferase increased	1 (0.4)	3 (1.1)

Table 3 lists the drug-related adverse events reported in the clinical study AS CS 01 FR with Aminoven 10%.

Table 3. Drug-related* Adverse Events observed in the clinical study AS CS 01 FR

Drug-related AEs n(%) of patients	Treatment group	
	Aminoven 10% (n=16)	Comparator (n=14)
Alkaline phosphatase elevations	1 (6.3)	1 (7.1)
Hyperglycaemia + osmotic polyurea	1 (6.3)	-

* Drug-related adverse events include those with relationship reported as being dubious, possible, likely, or very likely

Adverse Events in Table 4 are based on general assessment of trials and clinical experience of the product SmofKabiven.

Table 4. Adverse Events Summary from clinical trials and clinical experience

	Common >1/100, <1/10	Uncommon >1/1000, <1/100	Rare >1/10000, <1/1000
Cardiac disorders			Tachycardia
Respiratory, thoracic and mediastinal disorders			Dyspnoea
Gastrointestinal disorders		Lack of appetite, nausea, vomiting	
Metabolism and nutrition disorders		Elevated plasma levels of liver enzymes	
Vascular disorders			Hypotension, hypertension
General disorders and administration site conditions	Slight increase in body temperature	Chills, dizziness, headache	Hypersensitivity-reactions (e.g. anaphylactic or anaphylactoid reactions, skin rash, urticaria, flush, headache), heat or cold sensation, paleness, cyanosis, pain in the neck, back, bones, chest and loins.

Should these side-effects occur, the risk-benefits assessment of continuing infusion of SmofKabiven should be performed.

Reporting suspected adverse effects

Reporting suspected adverse reactions after registration of the medicinal product is important. It allows continued monitoring of the benefit-risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions at <https://www.tga.gov.au/reporting-problems>.

4.9 Overdose

Please also refer to section 4.4 Special warnings and precautions for use for information on “Fat overload syndrome”, “Excess of amino acid infusion” and “Excess of glucose infusion”.

If symptoms of overdose of fat or amino acids occur, the infusion should be slowed down or discontinued. There is no specific antidote for overdose. Emergency procedures should be general supportive measures, with particular attention to respiratory and cardiovascular systems.

Close biochemical monitoring would be essential and specific abnormalities treated appropriately.

If hyperglycaemia occurs, it should be treated according to the clinical situation either by appropriate insulin administration and/or adjustment of the infusion rate.

Additionally, overdose might cause fluid overload, electrolyte imbalances, and hyperosmolality.

In some rare serious cases, haemodialysis, haemofiltration or haemodiafiltration may be considered.

For information on the management of overdose, contact the Poison Information Centre on 131126 (Australia).

5 PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Mechanism of action

Lipid emulsion

The lipid emulsion of SmofKabiven is composed of SMOFlipid and has a particle size and biological properties similar to those of endogenous chylomicrons. The constituents of SMOFlipid, soya oil, medium chain triglycerides, olive oil and fish oil, have except for their energy contents individual pharmacodynamic properties.

Soya oil has a high content of essential fatty acids (linoleic acid and alpha-linolenic acid). The omega-6 fatty acid linoleic acid is the most abundant.

Medium-chain fatty acids are rapidly oxidised.

Olive oil mainly provides energy in the form of mono-unsaturated fatty acids.

Fish oil is characterised by a high content of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). DHA is an important structural component of cell membranes, whereas EPA is a precursor of eicosanoids as prostaglandins, thromboxanes and leukotrienes.

Amino acids and electrolytes

The amino acids, constituents of protein in ordinary food, are utilised for tissue protein synthesis and any surplus is channelled to a number of metabolic pathways. Studies have shown a thermogenic effect of amino acid infusion.

Glucose

Glucose should have no pharmacodynamic effects apart from contributing to maintain or replete the normal nutritional status.

Clinical trials

A randomised clinical trial has been conducted with SmofKabiven.

In the clinical trial 03-3CB7-001, 53 subjects who had undergone major intestinal surgery were randomised to receive either SmofKabiven (n=26) or Kabiven G19% (n=27) for 5 – 7 days as TPN. The majority of subjects received at least five study infusions: 19 (73.1%) of the SmofKabiven group and 18 (66.7%) of the Kabiven G19% group. Twenty-five (96.2%) of the SmofKabiven group and 23 (85.2%) of the Kabiven G19% group experienced at least one adverse event (AE). The most frequent AEs were gastrointestinal (nausea, flatulence and vomiting) and hypertension. Most events were mild to moderate in severity, with 17 subjects in the SmofKabiven group and 11 subjects in the Kabiven G19% group experiencing AEs which were considered to be possibly or probably related to the study drug. Serious AEs (SAEs) occurred in five subjects in the SmofKabiven group and two subjects in the Kabiven G19% group. All SAEs were judged to be unrelated to the study medication; being considered related to concomitant medication and the abdominal surgery the subjects had undergone. No clinically significant changes in vital signs were recorded.

No drug related serious AE was observed in the study. The majority of reported AEs were mild with 14/26 in the SmofKabiven group and 17/27 in the control group or moderate 19/26 and 10/27 respectively. Four patients in each group experienced at least one severe AE, however an unlikely relationship to the study drugs were found in the majority of patients in each group. One patient in the study group experienced an AE probably related to the study drug (nausea). A higher number of subjects experienced AEs that were possibly study drug related in the SmofKabiven group with symptoms like nausea, vomiting and flatulence, which also are common postoperative symptoms after major abdominal surgery.

5.2 Pharmacokinetic properties

Absorption

Amino acids and electrolytes

The pharmacokinetic properties of the infused amino acids and electrolytes are essentially the same as for amino acids and electrolytes supplied by ordinary food. Except the amino acids of dietary protein first enter the portal vein and then the systemic circulation, while intravenously infused amino acids directly reach the systemic circulation.

Characteristic changes in the physiological amino acid pool of the plasma are only foreseeable when the regulative function of essential organs like liver and kidneys are seriously impaired. In such cases, special formulated amino acids solutions may be recommended for restoring homeostasis.

Glucose

The pharmacokinetic properties of infused glucose are essentially the same as those of glucose supplied by ordinary food.

Distribution

No data available.

Metabolism

Amino acids and electrolytes

Only a small proportion of the infused amino acids are eliminated by the kidneys. For the majority of amino acids, plasma half-lives between 10 and 30 minutes have been reported.

Excretion

Lipid emulsion

The individual triglycerides in SMOFlipid have different clearance rates.

5.3 Preclinical safety data

Genotoxicity

The genotoxic potential of SmofKabiven has not been assessed. The lipid component of SmofKabiven, SMOFlipid, was not mutagenic or clastogenic in a battery of genotoxicity studies, including the Ames bacterial mutagenicity assay, a mammalian mutagenicity assay, a chromosome aberration assay in human peripheral lymphocytes, and an *in vivo* rat micronucleus assay.

Carcinogenicity

No carcinogenicity studies have been conducted with the combined components of SmofKabiven.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

- Glycerol
- Egg lecithin
- dl-alpha-tocopherol
- Sodium hydroxide (for pH adjustment)
- Sodium oleate
- Glacial acetic acid (for pH adjustment)
- Hydrochloric acid (for pH adjustment)
- Water for Injections

6.2 Incompatibilities

Only medicinal or nutrition solutions for which compatibility has been documented may be added to SmofKabiven. See section 4.2 Dose and method of administration, "Compatibility".

6.3 Shelf life

Shelf Life before mixing

2 years

Shelf life after mixing the contents of the three chambers

Chemical and physical in-use stability of the mixed three chamber bag has been demonstrated for 36 hours at 25°C.

From a microbiological point of view the product should be used immediately. If not used immediately, in-use storage times and conditions prior to use are the responsibility of the user and would normally not be longer than 24 hours at 2-8°C.

Shelf life after mixing with additives

From a microbiological point of view, the product should be used immediately when additions have been made. If not used immediately, the in-use storage time and conditions prior to use are the responsibility of the user and should normally not be longer than 24 hours at 2-8°C.

6.4 Special precautions for storage

Store below 25°C. Do not freeze. Store in overpouch.

Instructions for use

Do not use if package is damaged. Use only if the amino acid and glucose solutions are clear and colourless or slightly yellow and the lipid emulsion is white and homogeneous. The contents of the three separate chambers have to be mixed before use, and before any additions are made via the additive port, please refer to section 4.2 Dose and method of administration, Additives.

After separation of the peelable seals the bag should be inverted on a number of occasions to ensure a homogeneous mixture, which does not show any evidence of phase separation. (Please also refer to Appendix "SPECIAL HANDLING INSTRUCTIONS").

For single use in one patient only. Any mixture remaining after infusion must be discarded.

Excessive exposure to light and UV light should be avoided as peroxide formation may occur.

Any additions should be made aseptically.

6.5 Nature and contents of container

The container consists of a multi-chamber inner bag and an overpouch. The inner bag is separated into three chambers by peelable seals. An oxygen absorber is placed between the inner bag and the overpouch. The inner bag is made of a multilayer polymer film – Biofine.

The Biofine inner bag film consists of poly(propylene-co-ethylene), synthetic rubber poly[styrene-block-(butylene-co-ethylene)] (SEBS) and synthetic rubber poly(styrene-block-isoprene) (SIS).

The infusion and additive ports are made of polypropylene and synthetic rubber SEBS equipped with synthetic polyisoprene (latex-free) stoppers.

The blind port, which is only used during manufacturing, is made of polypropylene equipped with a synthetic polyisoprene (latex-free) stopper.

Pack sizes*

1 x 986 mL, 4 x 986 mL	AUST R 173890
1 x 1477 mL, 4 x 1477 mL	AUST R 180543
1 x 1970 mL, 4 x 1970 mL	AUST R 180546
1 x 2463 mL, 3 x 2463 mL	AUST R 180547

*Not all pack sizes may be marketed.

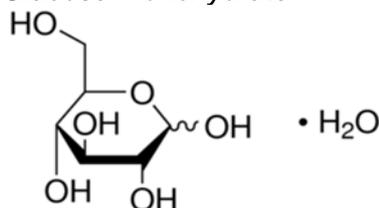
6.6 Special precautions for disposal

In Australia, any unused medicine or waste material should be disposed of in accordance with local requirements.

6.7 Physicochemical properties

Chemical structure

Glucose monohydrate



Empirical formula: 198.17 g/mol

Molecular weight: C₆H₁₂O₆·H₂O

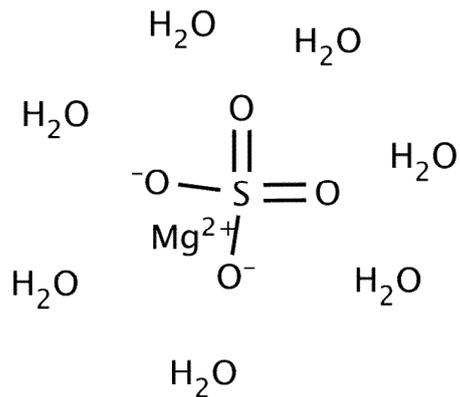
Calcium chloride dihydrate



Empirical formula: CaCl₂·2H₂O

Molecular weight: 147.01 g/mol

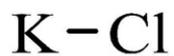
Magnesium sulfate heptahydrate



Empirical formula: $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$

Molecular weight: 246.47 g/mol

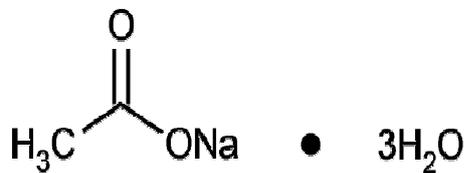
Potassium chloride



Empirical formula: KCl

Molecular weight: 74.55 g/mol

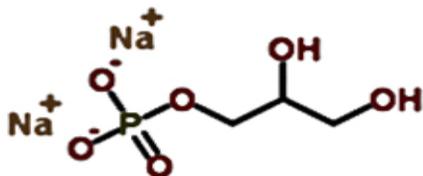
Sodium acetate trihydrate



Empirical formula: $\text{C}_2\text{H}_3\text{NaO}_2$

Molecular weight: 82.03 g/mol

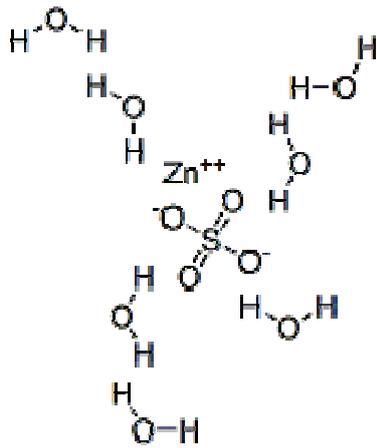
Sodium glycerophosphate



Empirical formula: $\text{C}_3\text{H}_7\text{Na}_2\text{O}_6\text{P}$

Molecular weight: 288.06 g/mol

Zinc sulfate heptahydrate



Empirical formula: $ZnSO_4 \cdot 7H_2O$
Molecular weight: 287.58 g/mol

CAS number

Active Substance
Amino Acids 5.1%

CAS number

Alanine	56-41-7
Arginine	74-79-3
Glycine	56-40-6
Histidine	71-00-1
Isoleucine	73-32-5
Leucine	61-90-5
Lysine acetate	57282-49-2
Methionine	63-68-3
Phenylalanine	63-91-2
Proline	147-85-3
Serine	56-45-1
Taurine	107-35-7
Threonine	72-19-5
Tryptophan	73-22-3
Tyrosine	60-18-4
Valine	72-18-4

Lipids 3.8%

Soya oil	8001-22-7
Fish oil - rich in omega-3 acids	8016-13-5
Medium chain triglycerides	73398-61-5
	65381-09-1
Olive oil	8001-25-0

Glucose 12.7%

Glucose monohydrate	5996-10-1
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Electrolytes 0.7%

Calcium chloride dihydrate	10035-04-8
Magnesium sulfate heptahydrate	10034-99-8
Potassium chloride	7447-40-7
Sodium acetate trihydrate	6131-90-4
Sodium glycerophosphate	1334-74-3
Zinc sulfate heptahydrate	7446-20-0

7 MEDICINE SCHEDULE (POISONS STANDARD)

Not Scheduled

8 SPONSOR

Fresenius Kabi Australia Pty Limited
Level 2, 2 Woodland Way
Mount Kuring-gai, NSW 2080
Australia
Telephone: (02) 9391 5555

9 DATE OF FIRST APPROVAL

09 Jan 2012

10 DATE OF REVISION OF THE TEXT

31 Jan 2022

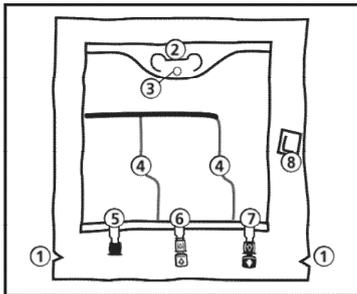
Summary table of changes

Section Changed	Summary of new information
2	Corrected the expression of active ingredients and added energy values
4.2	Separate titles added for dosage, method of administration and compatibility. Changed 'sterile' to 'aseptic' conditions. Added compatibility data from section 6.2
6.1	Removed excipient quantities
6.2	Compatibility data moved to section 4.2
8	Removed NZ sponsor details

APPENDIX: SPECIAL HANDLING INSTRUCTIONS

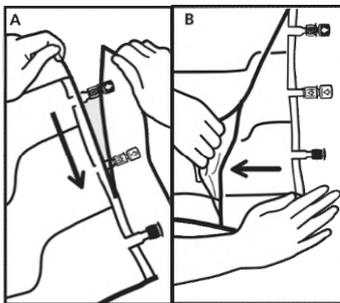
Biofine bag

- (1) Notches in the overpouch
- (2) Handle
- (3) Hole for hanging the bag
- (4) Peelable seals
- (5) Blind port (only used during manufacturing)
- (6) Additive port
- (7) Infusion port
- (8) Oxygen absorber



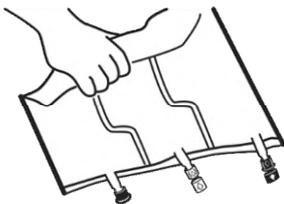
1. Removal of overpouch

- (A) To remove overpouch, hold the bag horizontally and tear from the notch close to the ports along the upper edge.
- (B) Then simply tear the long side, pull off the overpouch and discard it along with the oxygen absorber.



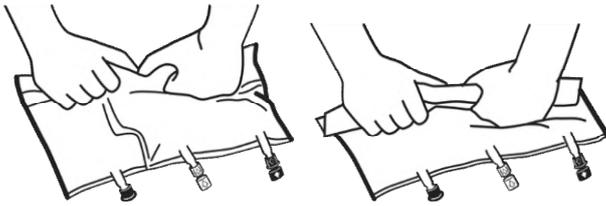
2. Mixing

- Place the bag on a flat surface with text side up and ports pointing away.
- Starting from the right hand corner, roll the bag tightly and diagonally with the right hand.

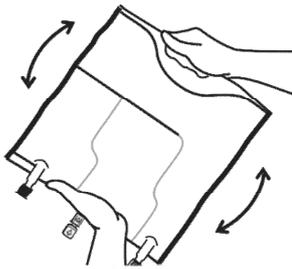


- Then applying a constant pressure with the left hand roll straight until the vertical seals are broken. The vertical peel seals open due to the pressure of the fluid. The peel seals can also be opened before removing the overpouch.

Please note: The liquids mix easily although the horizontal seal remains closed.

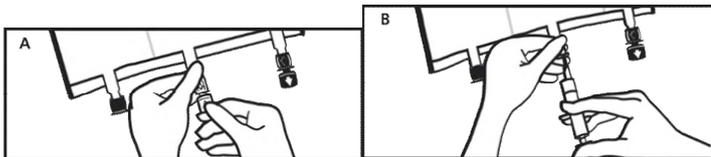


- Mix the contents of the three chambers by inverting the bag three times until the components are thoroughly mixed.

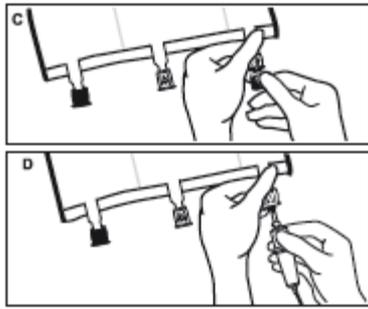


3. Finalising the preparation:

- (A) Place the bag on a flat surface with text side up again. Shortly before injecting the additives, break off the tamper-evident arrow flag from the white additive port.
Please note: The membrane in the additive port is sterile.
- (B) Hold the base of the additive port. Insert the needle, inject the additives (with known compatibility) through the centre of the injection site.
- Mix thoroughly between each addition by inverting the bag three times. Use syringes with needles of 18-23 gauge and a maximum length of 40 mm.



- (C) Shortly before inserting the infusion set, break off the tamper evident arrow flag from the blue infusion port.
Please note: The membrane in the infusion port is sterile.
- (D) Use a non-vented infusion set or close the air-inlet on a vented set.
- Hold the base of the infusion port.
- Push the spike through the infusion port. The spike should be fully inserted to secure it in place.
Please note: The inner part of the infusion port is sterile.



4. Hanging up the bag

- Hang the bag up by the hole below the handle.

