

Development a bags ready-to-use for parenteral nutrition in the preterm patient

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WHAT WAS DONE?

Seven standard bags (SSB), ready-to-use, have been formulated and developed for parenteral nutrition (PN) in preterm patients (PP). A assisted prescribing software was developed for selecting the most appropriate standard bags (SB).

HOW WAS IT DONE?

The project was carried out in collaboration between pharmacists, nurses and neonatologist of NICU. The composition of the SB was identified from the retrospective analysis of the types of individualized bags requested from the Pharmacy and from the analysis of there recommended ESPGHAN-Paediatric-ParenteralNutrition-2018 contributions.

WHAT HAS BEEN ACHIEVED?

SSB ready-to-use were identified (Table 1).

The bags have been produced by an industrial partner according to **Good Manufacturing Practice-Annex 1**.

The shelf life is 90 days.

The SSB were implemented successfully on the PP.

Starting from 2021, **approximately 250 bags/month have been used**, with a reduction in individual preparations by the Pharmacy of approximately 80%.

This approach showed results in terms of clinical results (Graph 1) and economic outcomes (Graph 2).

Early and timely administration of ready-to-use PN showed reduced weight loss (Graph 3) and a shorter duration of PN than individualized bags (21 vs 25 days) (Graph 4).

WHY WAS IT DONE?

The purpose was to provide the Neonatal-Intensive-Care-Unit (NICU) with ready-to-use bags that could improve patient safety by minimizing procedural incidents and maximize resource efficiency while providing clinically appropriate nutrition for the single PP.

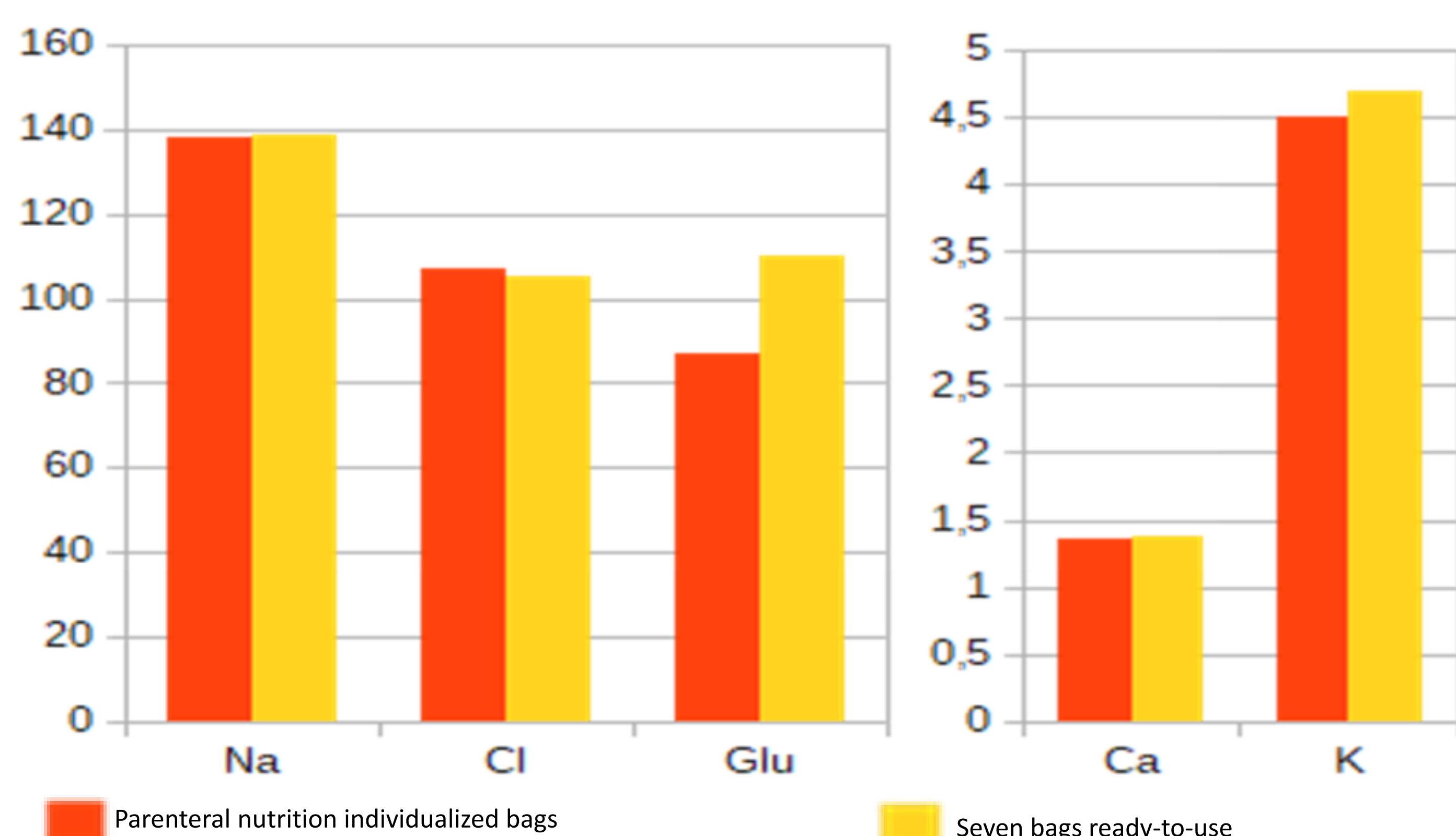


ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Amino acids	van Goudoever et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Standard versus individualized parenteral nutrition	Riskin et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition	Mihatsch et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Calcium, phosphorus and magnesium	Mihatsch et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Carbohydrates	Mesotten et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Lipids	Lapillonne et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Energy	Joosten et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Fluid and electrolytes	Jochum et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Complications	Hartman et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Iron and trace minerals	Domellof et al.	2018
ESPGHAN/ESPEN/ESPR/CSPEN guidelines on pediatric parenteral nutrition: Vitamins	Bronsky et al.	2018

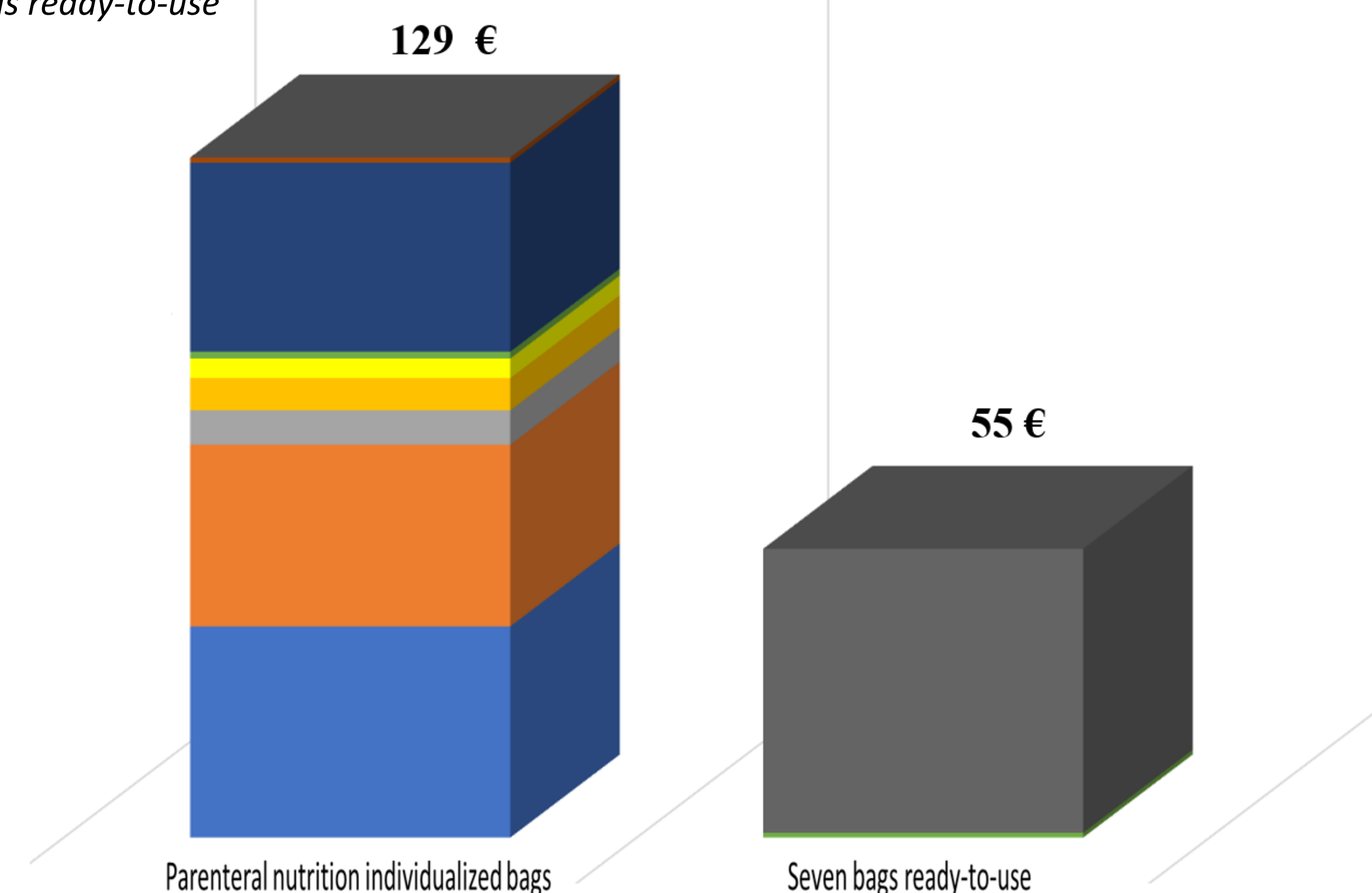
Table 1. Composition of Seven bags ready-to-use identified.

FORMULATION	BAG-1	BAG-2	BAG-3	BAG-4	BAG-5	BAG-6	BAG-7
AMMINOACIDS-(GRAMS)	10	20	15	13	17	15	10
GLUCOSE-(GRAMS)	30	60	50	50	50	55	50
SODIUM-(MEQ)	6	0	5	12	16	18	14
POTASSIUM-(MEQ)	5	8	9	9	12	9	0
CALCIUM-(MEQ)	0	10	9	9	10	3	2
MAGNESIUM-(MEQ)	0	1	1	2	2	3	1
PHOSPHATE-(MEQ)	0	0	5	12	16	12	5
CHLORIDE-(MEQ)	5	1	1	2	2	12	1
OLIGOELEMENTS-(ML)	0	4	4	4	4	0	0
FINAL VOLUME	404	531	451	520	461	520	462
OSMOLARITY	660	986	969	840	1039	923	839

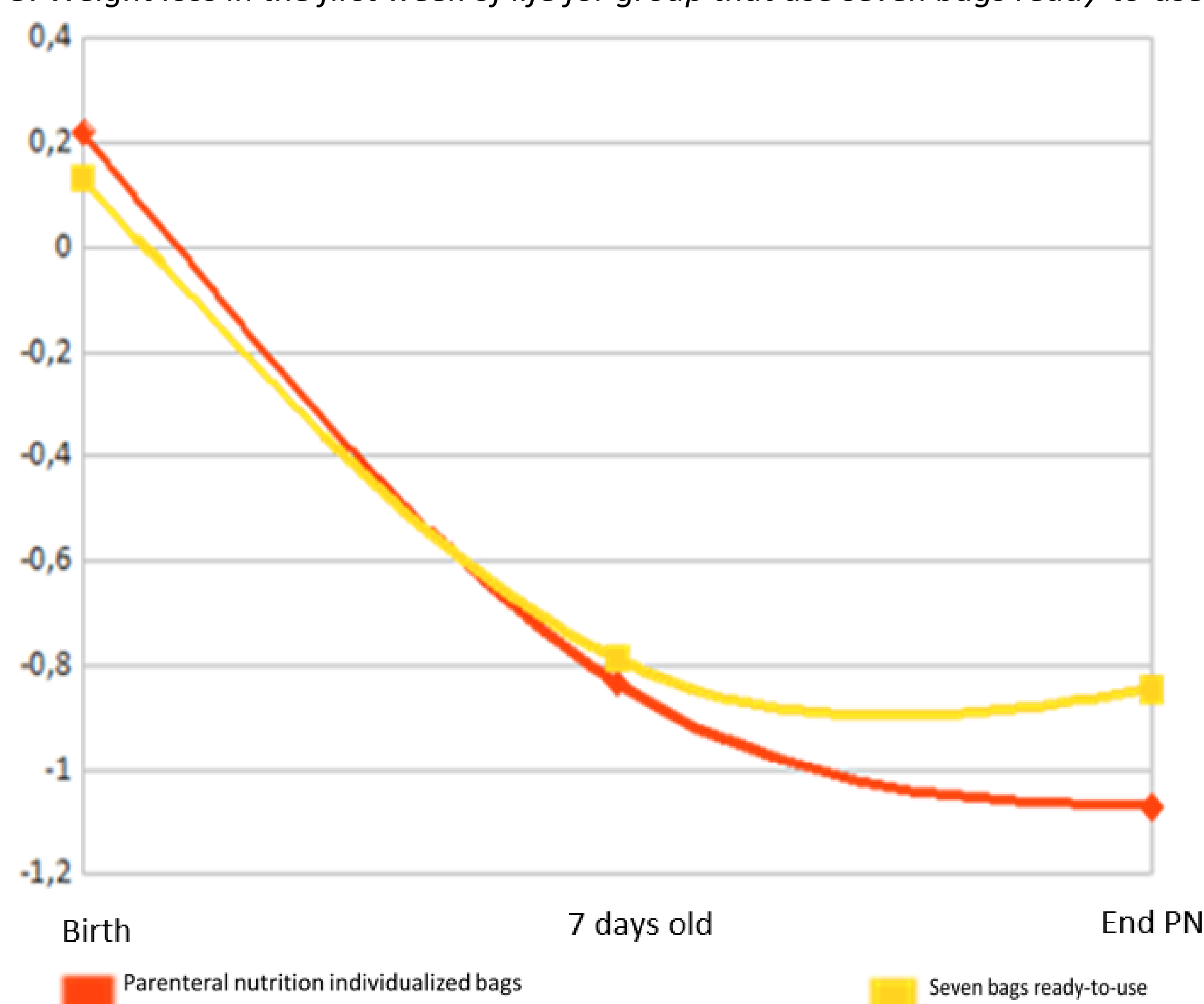
Graph 1: Average nutrient values



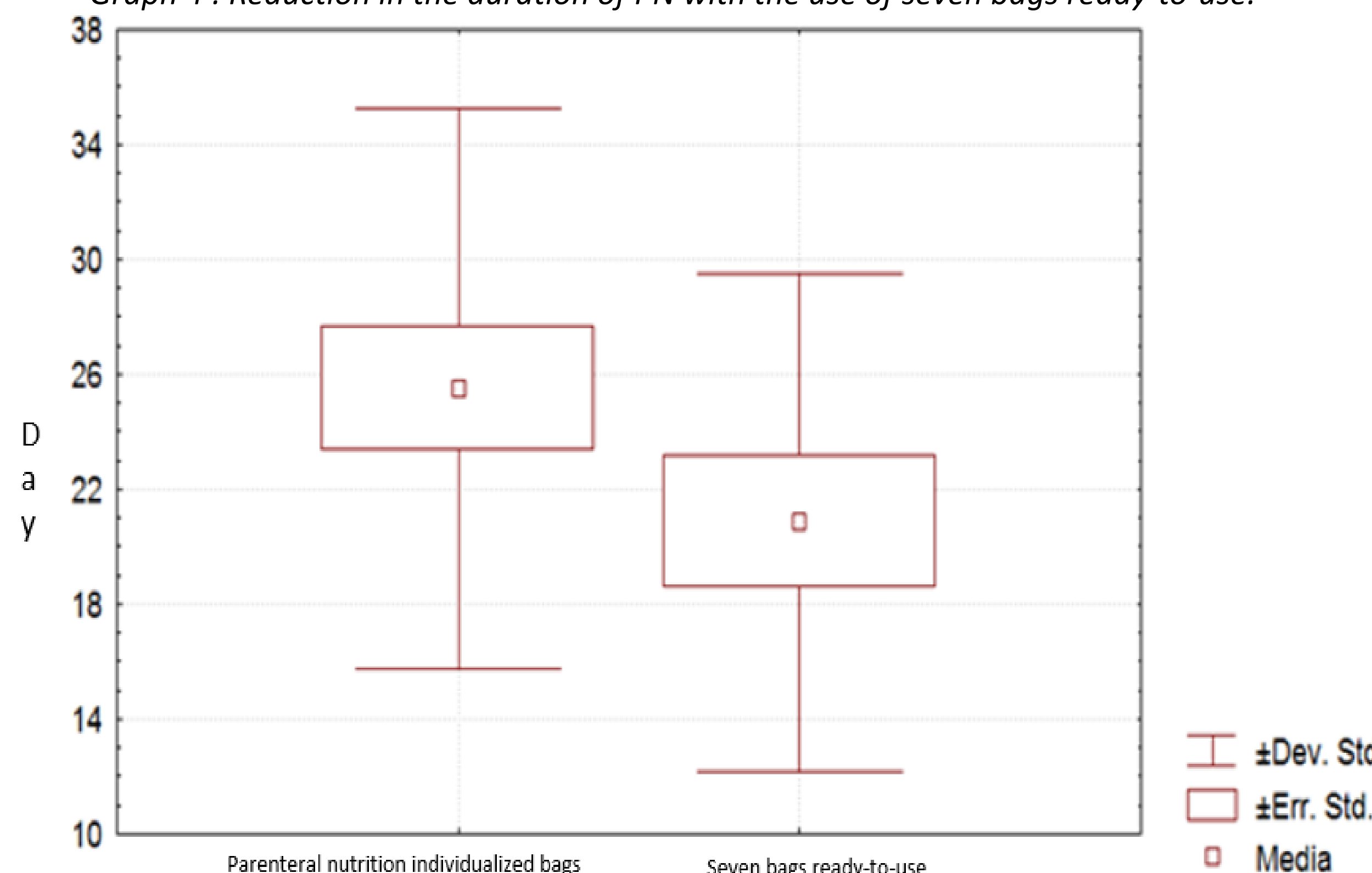
Graph 2: Difference in average costs between parenteral nutrition individualized bags and seven bags ready-to-use



Graph 3: Weight loss in the first week of life for group that use seven bags ready-to-use.



Graph 4: Reduction in the duration of PN with the use of seven bags ready-to-use.



WHAT NEXT?

The project described has shown benefits including improved nutrient supply, fewer prescribing and administration errors, lower risk of infection, cost savings, ready availability of the bags 24/7 and safe and effective supply of SB. This project will be strengthened in our hospital.

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