

Summary report of comparative testing of gum-based thickeners: Thickness accuracy and stability over time¹

All testing was carried out using an independent consultant and funded by Fresenius Kabi.

Aims

This investigation sought to quantify and compare the performance of four commercial food and drink thickeners in terms of thickness accuracy and stability over long time periods.

Methods

Four powdered gum-based food and drink thickener brands with different blends of ingredients including maltodextrin, xanthan gum, guar gum and carrageenan from the following manufacturers were investigated:

A Fresenius Kabi - Thick & Easy® Clear

B Nutricia - Nutilis Clear

C Nualtra - Swalloweze Clear

D Nestle - Resource® ThickenUp® Clear

Each thickener was mixed with 200ml (±1ml) of bottled mineral water to the manufacturers' recommended ratios for IDDSI² Levels 1 to 4. The thickener powder was weighed (±0.01g) rather than using scoops. Thickness was measured with the IDDSI flow test over short-term 1-60 minutes and long-term 1-24 hours (samples were stored refrigerated, then extracted and tested at room temperature). At least three individual samples, at each level, were tested from each thickened drink at each time point. Values reported were means of these repeated tests. All drinks were tested at room temperature, defined as 24°C +/-1°C. For IDDSI Levels 1-3, the IDDSI flow test was performed using an IDDSI Funnel and a separate 10-ml syringe (BD model 305959) was additionally used for verification. Level 3 and 4 mixtures were tested using the IDDSI fork drip test.



This testing was accepted as a poster presentation at European Society for Swallowing Disorders (ESSD) and The Irish Association of Speech and Language Therapists (IASLT) 2023 congresses.



Results

Accuracy:

One thickener (Thick & Easy® Clear) achieved all four IDDSI Level thickness targets over short and long durations. Other thickeners missed one or more level boundaries either temporarily or at steady state.

Short term stability:

At IDDSI Level 1 (thinnest) most thickeners (3 out of 4) remained within the defined Level 1 range, despite a small gradual increase in thickness. At IDDSI Levels 2 and 3, all thickener types reached a stable thickness within 3-5 minutes, however one thickener, Swalloweze Clear, failed to meet the defined Level 2 and Level 3 range being too thick. At Level 4, 3 out of the 4 thickeners meet the level criteria, with one thickener, ThickenUp Clear, being too thin for a Level 4.

IDDSI Level	Thick & Easy Clear	Nutlis Clear	Swalloweze Clear	ThickenUp Clear
1	✓	X ¹	✓	- ²
2	✓	✓	- ³	✓
3	✓	✓	- ⁴	✓
4	✓	✓	✓	X ⁵

Notes

- At 5 minutes this measured too thin for Level 1; although it continued to thicken with time, it only reached a thickness on the borderline between 0 and 1, not being conclusively Level 1.
- At 5 minutes this was borderline between Level 0 and 1; however, after 5 minutes the liquids thickened into the Level 1 range and remained in Level 1.
- At 5 minutes, this was on the borderline between Level 2 and 3, then after 5 minutes the liquids thickened above the Level 2 range and remained too thick for the required range.
- Borderline too thick for Level 3; typically only 1-3 drips from the IDDSI flow test, resulting in very little measurable flow.
- Too thin for Level 4

Long term stability:

At Level 1, thickness increased slightly from 10 to 60 minutes but thereafter remained stable up to 24 hours. At IDDSI Levels 2 - 4 all thickeners remained stable over the 24-hour period (within 0.5ml). However, at each level, 1 out of the 4 thickeners failed to meet the defined criteria (see table below).

IDDSI Level	Thick & Easy Clear	Nutlis Clear	Swalloweze Clear	ThickenUp Clear
1	✓	- ¹	✓	✓
2	✓	✓	X ²	✓
3	✓	✓	- ³	✓
4	✓	✓	✓	X ⁴

Notes

- Measurements were on the borderline between Level 0 and Level 1 - product is not conclusively either level.
- The mixture measured too thick for IDDSI Level 2 throughout.
- Borderline too thick for Level 3; typically only 1-3 drips from the IDDSI flow test, resulting in very little measurable flow.
- Too thin for Level 4

Conclusion

In all cases thickening occurred rapidly, reaching within 5% of final thickness within 5 minutes. IDDSI Levels were within range in 14 out of 16 cases at 10 minutes. In both the short and long term thickness stability tests, Thick & Easy® Clear was the best performing gum-based thickener, producing mixtures which correctly matched the IDDSI framework for all Levels 1-4 and remaining stable up to 24 hours.

1. REPORT: Assessing Thick & Easy Clear against other gum-based thickeners. May 2023. Data on file.
2. Cichero JA, et al. Development of International Terminology and Definitions for Texture-Modified Foods and Thickened Fluids Used in Dysphagia Management: The IDDSI Framework. *Dysphagia*. 2017;32(2):293-314. <http://iddsi.org/framework/>



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