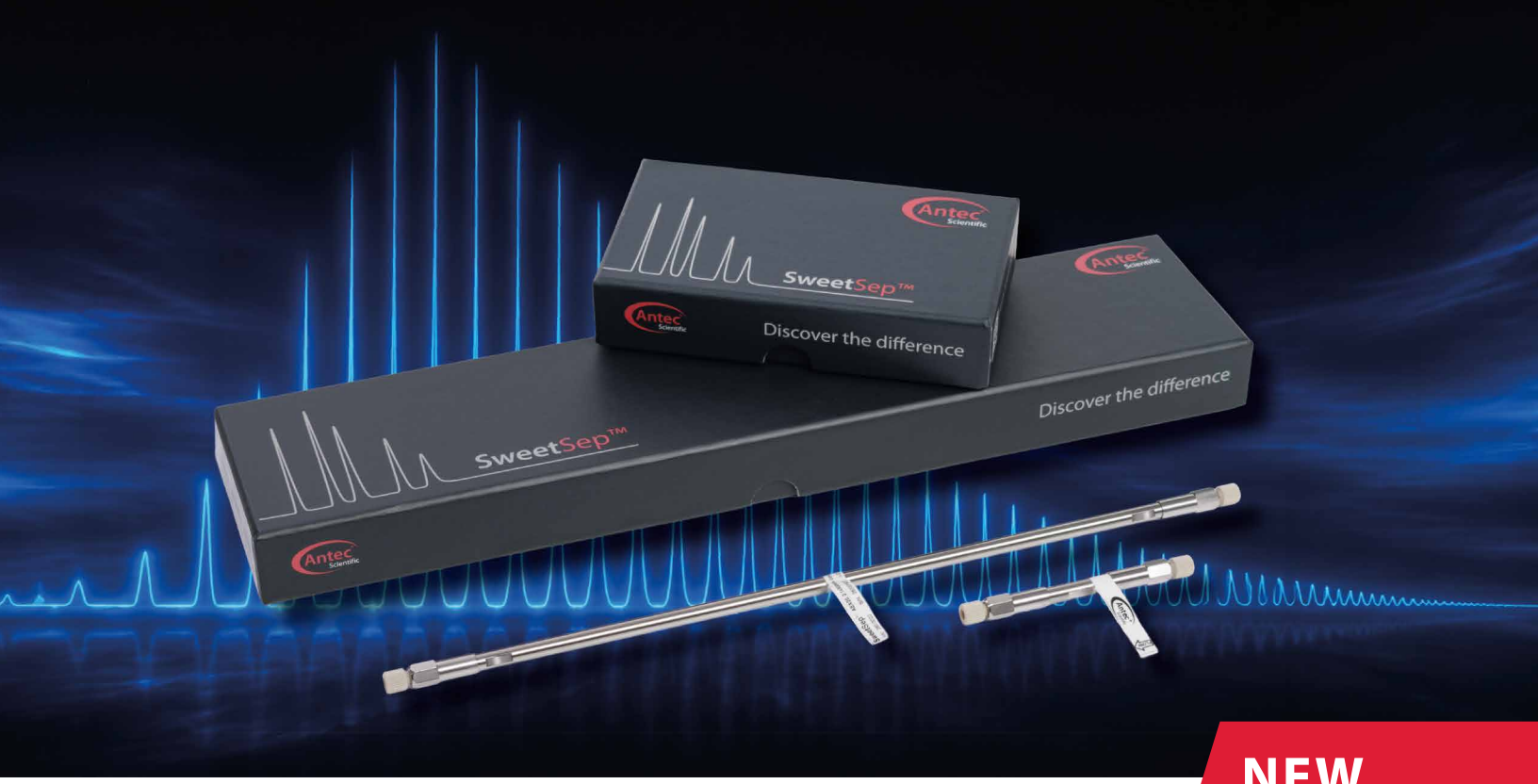


NEW

High-Resolution SweetSep™ Columns

Complex Carbohydrate Analysis

- 30 cm long for highest efficiency
- Higher peak capacity
- Enhanced resolution and selectivity

The 30 cm high-resolution SweetSep High-Performance Anion Exchange (HPAE) columns are the ideal columns for analyzing complex samples and for better separation of closely eluting compounds.

Antec® Scientific

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Advantages of 30 cm High Resolution (HR) Columns

- **Higher separation efficiency**
  Longer columns improve resolution (Rs $\propto \sqrt{N}$) and reduce peak overlap, yielding better separation of similar compounds and complex mixtures. Compared with the 20 cm version, the 30 cm column delivers up to 33% higher plate counts, achieving efficiencies approaching 30,000 plates per column (100,000 plates/m).

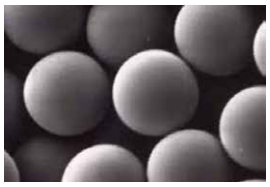
- **Better peak capacity**
  More analytes are separated in a single run, which is useful for complex samples and gradient separations.

- **Improved quantitative accuracy**
  Cleaner separation reduces integration errors and improves precision, sensitivity, and assay reliability.

- **Enhanced selectivity**
  Long columns help separate difficult compounds such as isomers, degradation products, chiral compounds, and co-eluting compounds.

Trade-offs of 30 cm HR-Columns

- **Moderate increase in back pressure**
  Longer columns increase column back pressure ($\Delta P \propto L$), which can exceed instrument limits. However due to the use of fully monodisperse 5 µm particles as stationary phase for all our SweetSep columns their back pressure is moderate. Typical back pressures at the optimal flow rate of 180 µL/min are not higher than 180 bar (2600 psi). When used with additional pre-column of 2.1 mm ID x 5 cm pressure does not exceed 230 bar (3300psi).



SEM image of 5 µm monodisperse SweetSep particles, demonstrating their uniform morphology contributing to low back pressure.

- **Longer run times**
  The increase in retention time, which leads to longer analysis times, reduced sample throughput, and higher solvent consumption, is more than offset by the improved quality of the analytical data.

Available Chemistries and Dimensions

SweetSep AEX20

Ideal for high-resolution separation of mono- to tetra- saccharides from food samples, monosaccharides from glycoproteins, sialic acids, etc.

SweetSep AEX200

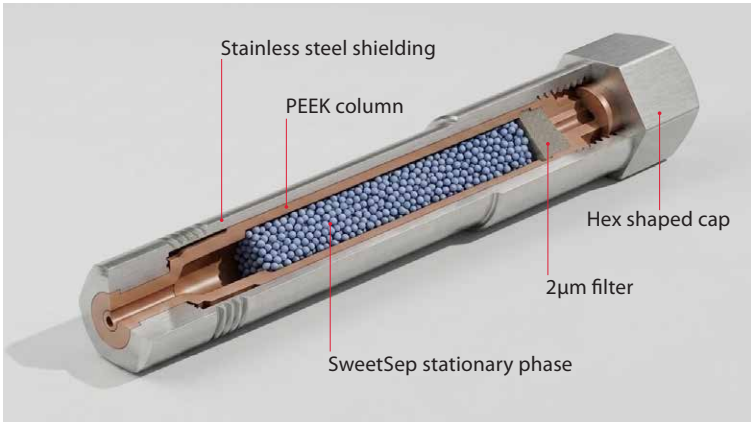
Universal column for separation of mono- to polysaccharides in food & beverages, plants and glycans.

Dimensions

All 30 cm columns are available with an inner diameter of 2.1 mm. Matching 5 cm pre-columns (2.1 mm ID) are also available and are recommended for use upfront the analytical column as a guard column to protect and extend its lifetime.

Column hardware

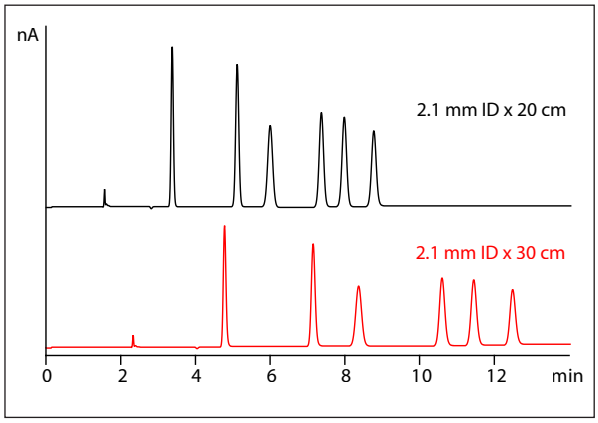
The column blank is metal shielded to withstand higher column pressures. All parts in contact with mobile phase are made of inert PEEK.





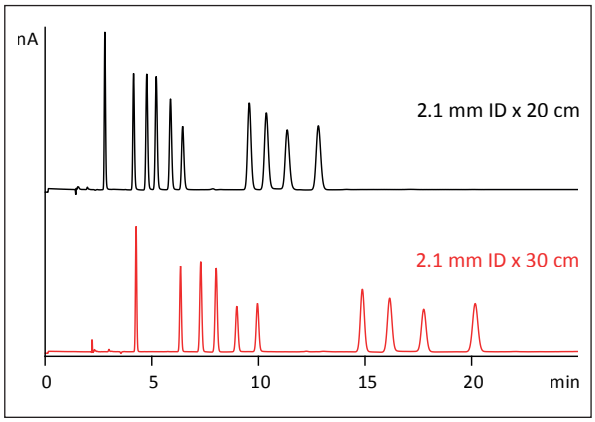
Performance Comparison 20 vs 30 cm Columns

SweetSep™ AEX20



Mono- to tetra saccharides

SweetSep™AEX200



Mono- to polysaccharides

Performance Data 30 cm Column (SweetSep AEX20)

In table 1 typical performance data for a 2.1 mm ID x 30 cm SweetSep column packed with AEX20 is shown.

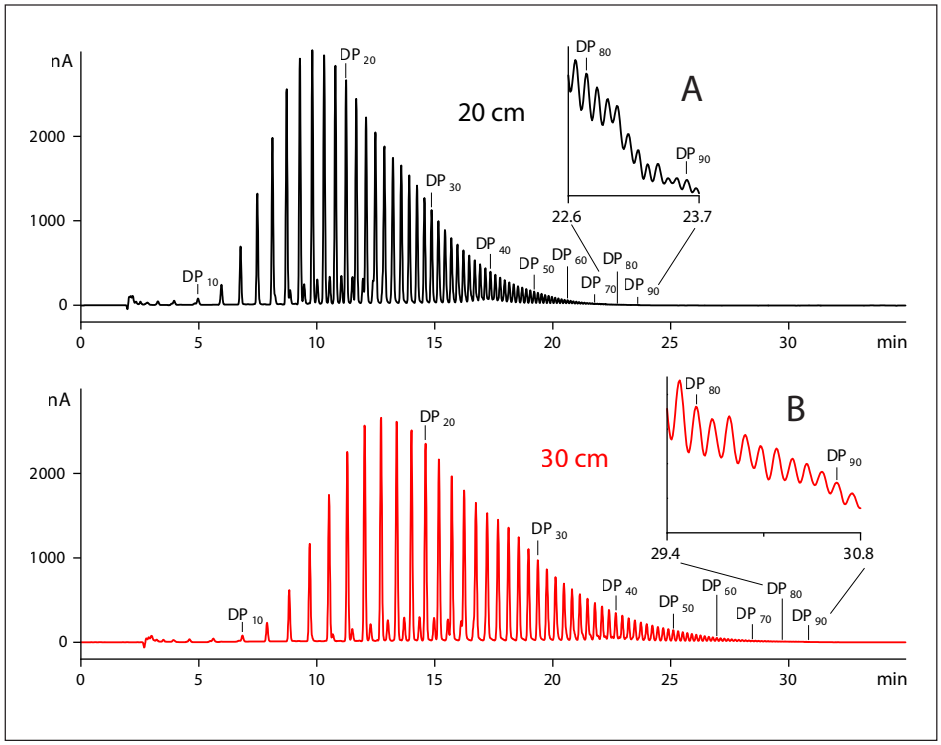
Compound Name	Reten. Time [min]	W05 [min]	Efficiency [th.pl]	Resolution [-]	Symmetry/ Tailing [-]	h [-]
Fucose	4.56	0.08	16576		1.12	3.6
Galactosamine	6.81	0.12	18867	13.28	1.14	3.2
Glucosamine	7.98	0.18	11505	4.72	1.01	5.2
Galactose	10.09	0.16	22506	7.49	1.07	2.7
Glucose	10.90	0.16	26255	3.01	1.07	2.3
Mannose	11.89	0.16	31250	3.70	1.09	1.9

Table 1 demonstrates the excellent column performance, with a high efficiency of 31,250 for Mannose (≥100,000 plates/m) and a reduced plate height (h) of 1.9, see red circles.

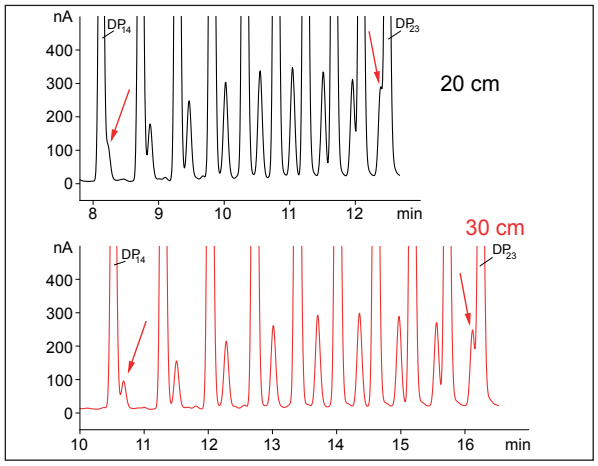
Example 1

Separation of Fructans

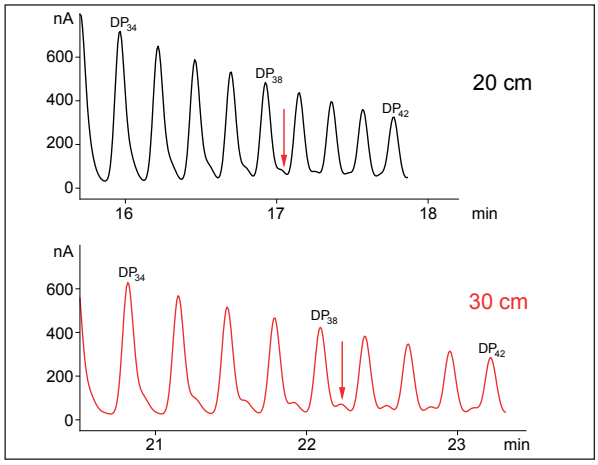
Fructans are a type of oligosaccharide often called fructo-oligosaccharides (FOS) when they are short chains of fructose. Longer-chain fructans (like inulin) are considered polysaccharides. They act as prebiotic carbohydrates naturally found in many plants, but are often the hidden culprit behind wheat sensitivities and digestive discomfort (fructan intolerance). Fructans are often used as food additive in processed products, e.g., as prebiotics in infant formula.



Separation of fructans on a 2.1 mm ID SweetSep column, 20 and 30 cm long. Superior separation of all oligosaccharides on 30 cm long column, cleary visible between DP_{80} and DP_{90}, see inserts (A) and (B).



Zoom-in on oligosaccharides DP_{14} - DP_{23}. Red arrows on DP_{14} and DP_{23} illustrate the superior separation of interfering isomers on the 30 cm column.

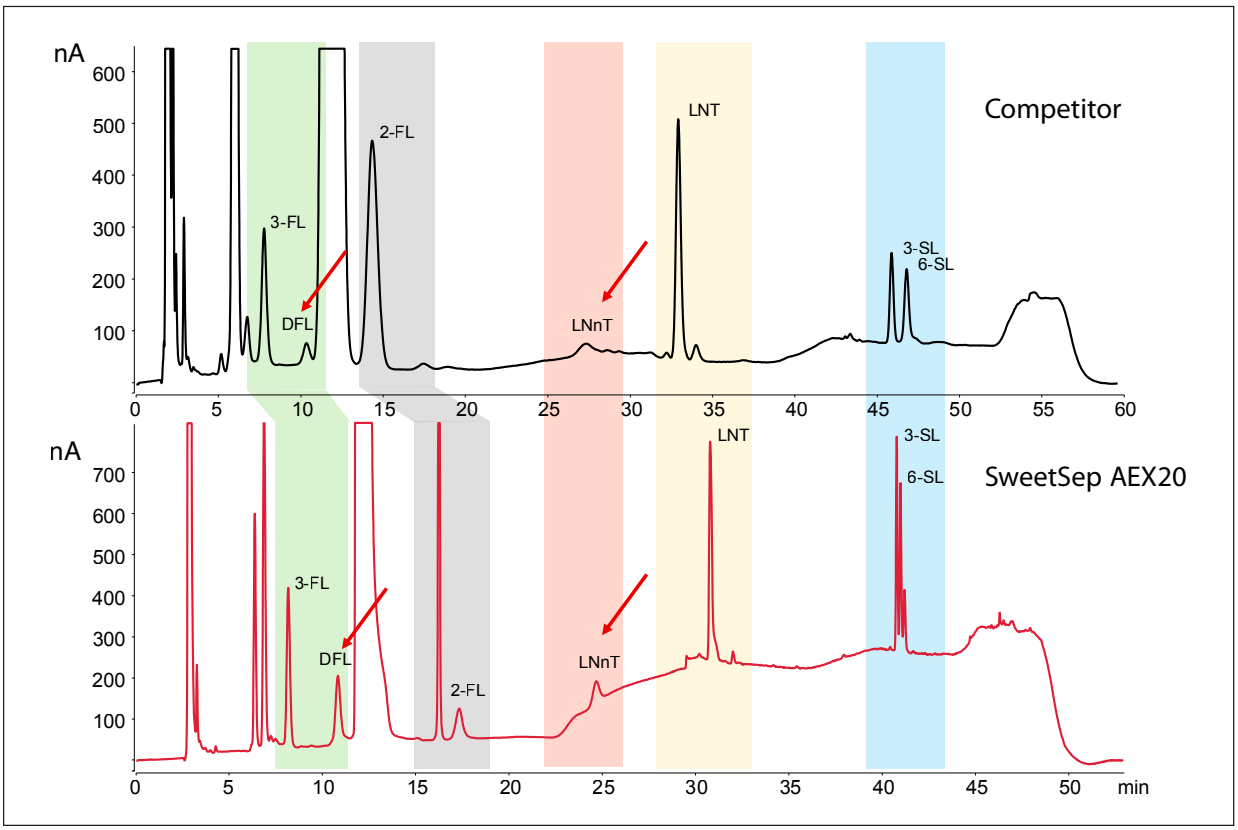


Zoom-in on oligosaccharides DP_{34} - DP_{42}. Red arrow after DP_{38} illustrates the superior separation of an interfering isomer on the 30 cm column.

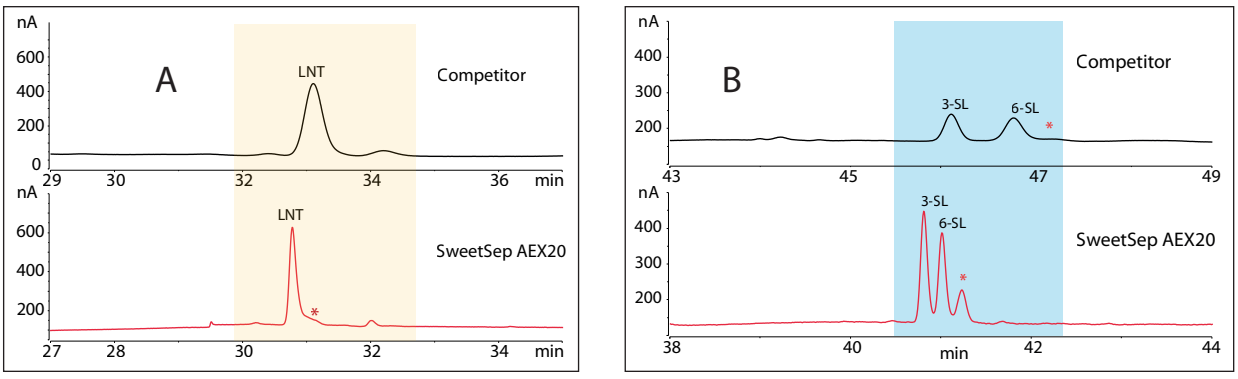
Example 2

Human Milk Oligosaccharides (HMOS) in Infant Formula

Human Milk Oligosaccharides (HMOs) are complex, indigestible sugars naturally present in human breast milk. They act as powerful prebiotics that feed beneficial gut bacteria, and also also serving as "decoys" that block harmful viruses and pathogens from attaching to an infant's gut wall.



Separation of a HMOS sample comparing a 25 cm column from a competitor with 30 cm SweetSep column. Components: (green ribbon) 3-Fucosyllactose (3-FL), and Difucosyllactose (DFL), (gray) 2'-Fucosyllactose (2-FL), (red) Lacto-N-neoTetraose (LNnT), (yellow) Lacto-N-Tetraose (LNT), (blue) 3'-Sialyllactose (3-SL) and 6'-Sialyllactose (6-SL). Much better separation on SweetSep column of the crucial DFL from the large interfering peak eluting at ca. 12 min (green), two peaks found in 2-FL (gray), and better peak shape for LNnT (yellow).



(A) LNT with additional shoulder peak (*), and (B) triplet found for 3-SL and 6-SL(*).

Recommended Instrumentation

For laboratories seeking consistent, reliable, and highly reproducible results across days, users, and locations, the Antec's Scientific ALEXYS™ Carbohydrate Analyzer is highly recommended.

Paired with SweetSep™ columns, the system delivers exceptional chromatographic performance backed by 40+ validated applications, ensuring confidence in both routine and advanced carbohydrate analyses.



ALEXYS™ Carbohydrates Analyzer consisting of the ET210 eluent tray, P6.1L quaternary LPG pump, AS6.1L autosampler, CT2.1 column thermostat, and the DECADE™ Elite electrochemical detector.

Conclusions

- 30 cm high-resolution SweetSep™ columns ideal for complex sample analysis, e.g., fructans, HMOS, etc.
- Fully inert metal shielded PEEK columns (all parts in contact with mobile phase made of PEEK)
- Two chemistries available SweetSep AEX20 & AEX200
- Only marginal increase in column back pressure
- Up to 30,000 plates/column
- Highest performance in combination with ALEXYS™ Carbohydrate Analyser

Ordering Information

Ordering Information	
Part no.	**Description**
30 cm high resolution columns	
260.0012	SweetSep™ AEX200, 2.1 mm ID x 30 cm, 5µm
260.0022	SweetSep™ AEX20, 2.1 mm ID x 30 cm, 5µm
5 cm pre-columns	
260.0016	SweetSep™ AEX200, 2.1 mm ID × 5 cm, 5 µm
260.0026	SweetSep™ AEX20, 2.1 mm ID × 5 cm, 5 µm

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