Multus Biotechnology Limited
84 Wood Lane, W12 0BZ, UK
VAT: 350776390
Company No.: 12524885
Registered in England and Wales
info@multus.bio

Document: ProdSpec DMFG01
Created on: 24 APR 2025 **Created by**: Julian Arjuna Bisten
Revision number: 20250506 **Last approved by:** Julian Arjuna Bisten

Product Specification Sheet
Food Grade DMEM/F12

Traditional basal media formulations like DMEM/F12 have long been essential for cell culture but remain unsuitable for large-scale food production due to pharmaceutical-grade components and regulatory challenges. This creates significant barriers for companies in the cellular agriculture sector seeking to move from lab to commercial scale.

At Multus, we've developed DMEM/F12-FG, a food-grade basal media specifically designed to address these challenges. By leveraging AI and automation to identify functionally equivalent food-grade ingredients, our product provides essential nutrients required for optimal cell growth while ensuring regulatory compliance. Both formulated to food-grade specifications and manufactured in our FSSC 22000-certified facility, DMEM/F12-FG was developed in collaboration with global food and feed ingredient companies to ensure supply chain stability and scalability for confident advancement toward commercial production.

Functional Profile

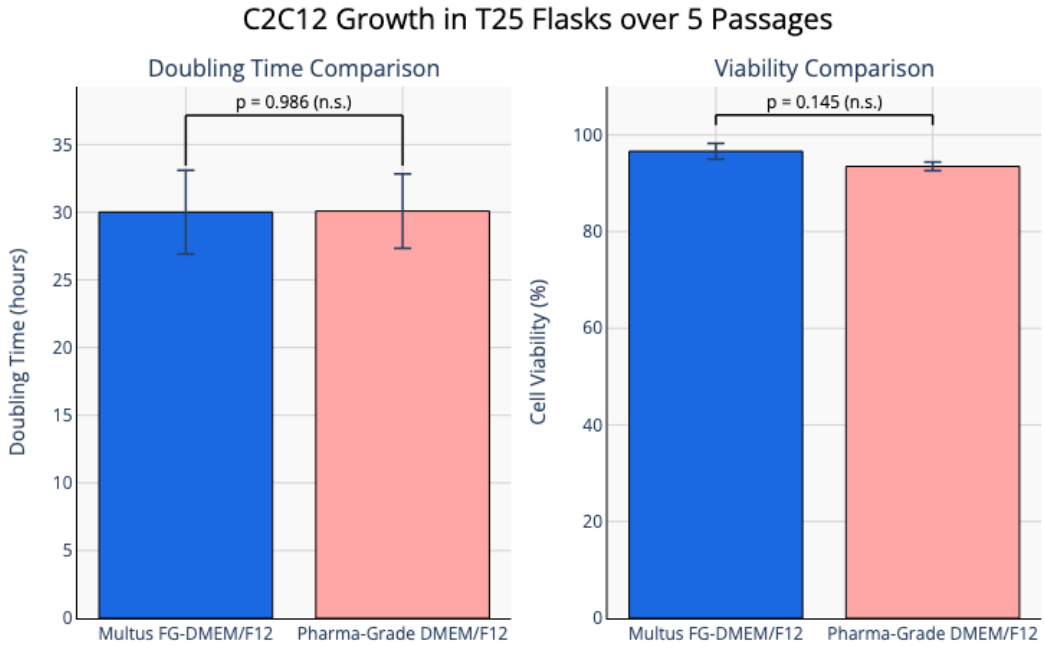

Figure 1: *C2C12 Growth in T25 Flasks over 5 Passages. Left panel shows doubling time comparison between cells cultured in Multus DMEM/F12-FG (blue) and pharma-grade DMEM/F12 (pink), p = 0.986 (n.s.). Right panel shows viability comparison between the same conditions, p = 0.145 (n.s.). Both media were supplemented with 1X Proliferum M serum.*

Multus Biotechnology Limited
84 Wood Lane, W12 0BZ, UK
VAT: 350776390
Company No.: 12524885
Registered in England and Wales
info@multus.bio

Document: ProdSpec DMFG01
Created on: 24 APR 2025 **Created by**: Julian Arjuna Bisten
Revision number: 20250506 **Last approved by:** Julian Arjuna Bisten

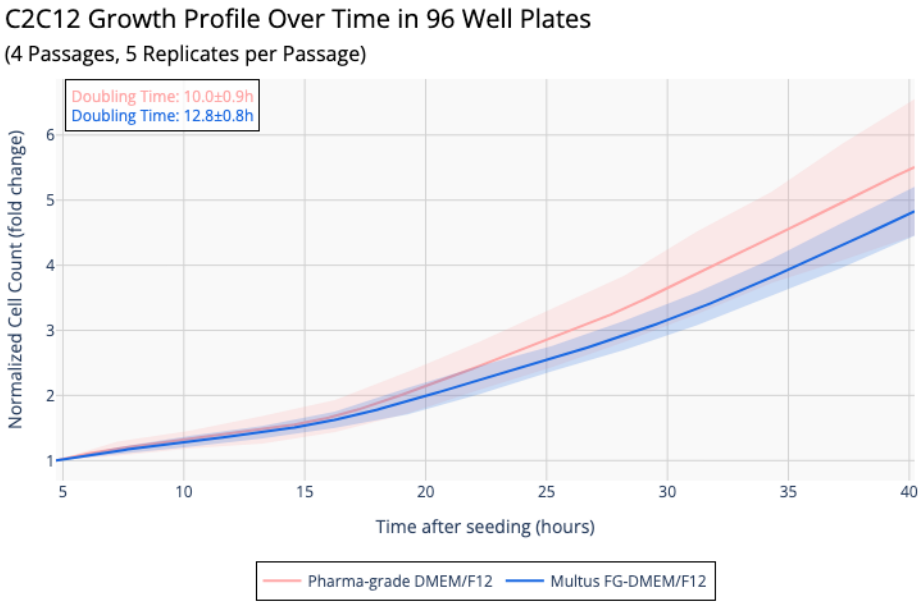

Figure 2: *C2C12 Growth Profile Over Time in 96 Well Plates Over 4 Passages. Comparison between cells cultured in Multus DMEM/F12-FG (blue) and pharma-grade DMEM/F12 (pink) supplemented with 1X Proliferum M serum (n=5 per condition). No statistically significant differences were observed between culture conditions.*

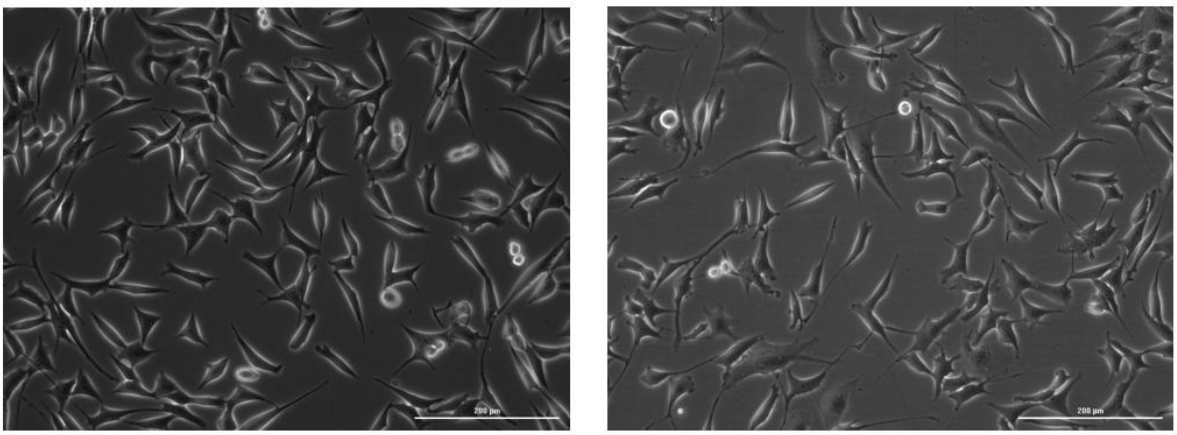

Figure 3: *C2C12 cell morphology after 3 passages in different media. Left: Multus FG DMEM/F12; Right: Pharma-Grade DMEM/F12. Both media supplemented with 1X Proliferum M serum. Phase contrast microscopy at 200 µm scale shows comparable cell morphology between conditions.*

Multus Biotechnology Limited
84 Wood Lane, W12 0BZ, UK
VAT: 350776390
Company No.: 12524885
Registered in England and Wales
info@multus.bio

Document: ProdSpec DMFG01
Created on: 24 APR 2025 **Created by**: Julian Arjuna Bisten
Revision number: 20250506 **Last approved by:** Julian Arjuna Bisten

Quality Control

Table 1: *Quality Control (QC) tests and their specifications.*

Test	Specification
pH	7.0 – 7.5
Osmolarity (mOsm/kg)	290 - 340
Bacterial Testing	Negative
Fungal Testing	Negative
Mycoplasma Testing	Negative
Particulate Examination	Negative
Sterile Filtration	0.2µm
Cell Growth	Pass

Usage Instructions

- **Format:** Ready-to-use liquid. No dilution or reconstitution required.
- **Storage:** Store at 2-8°C upon receipt. Do not freeze. Protect from light to preserve light-sensitive components.
- **Sterility:** This product is manufactured under sterile conditions and sterile-filtered through a 0.2µm membrane. Additional filtration (0.2µm or 0.45µm) is not recommended, as it may affect product performance.
- **Shelf Life:** Use within 3 months of opening. Shelf life and stability under various conditions are currently under evaluation.
- **pH:** Final pH may vary depending on supplementation (e.g. serum or serum-free formulations). The product contains food-grade sodium bicarbonate, which is an effective buffer under CO_2-controlled atmospheric conditions.
    - **Cell culturing in non-CO_2 environments – research grade:** HEPES buffer may be added at 15 mM. Note, it will render the product non-food-grade.
    - **Cell culturing in non-CO_2 environments – food grade:** Citrate buffer may be used. Concentrations need to be determined based on the specific final formulation and existing conditions.
    - **Visual pH monitoring – research grade:** Phenol red may be added at 10–15 mg/L (0.001–0.0015%). Note, it will render the product non-food-grade.
    - **Visual pH monitoring – food grade:** Anthocyanin extracts or curcumin may be used. Concentrations need to be determined based on the specific final formulation and existing conditions.

Multus Biotechnology Limited
84 Wood Lane, W12 0BZ, UK
VAT: 350776390
Company No.: 12524885
Registered in England and Wales
info@multus.bio

- **Osmolarity:** Final Osmolarity may vary depending on supplementation (e.g. serum or serum-free formulations). For cell types sensitive to osmotic stress, adjust osmolarity as needed using 5 M NaCl or equivalent salt solutions.
- **Preparation of Complete Media:** Supplement DMEM/F12-FG with your serum or animal component-free (ACF) media of choice following standard basal media dilution protocols. Allow the complete media to equilibrate to room temperature (~25°C) before use. Minimise exposure to light during handling.
- **Media Exchange:** For optimal cell health and performance, we recommend media exchange every 48 hours, or as required by your specific protocol.