Fatty Acid Chains in Plant Oils and Butters

Chain Type	Examples of Fatty Acids	Plant Sources	Benefits for Skin and Hair
Short-Chain (C4–C6)	Caproic, Caprylic	Trace amounts in palm kernel oil, coconut oil	Lightweight, quick absorption, minimal residue. Rare in plants, usually present in small amounts.
Medium-Chain (C8–C12)	Caprylic, Capric, Lauric	Coconut oil, Babassu oil, CCT oil, MCT oil, Fractionated coconut oil	Easily absorbed, antimicrobial, supports acne-prone skin, penetrates hair shaft to reduce breakage.
Long-Chain (C14–C21))	Palmitic, Stearic, Oleic, Linoleic	Shea butter, Cocoa butter, Mango butter, Olive oil, Sunflower oil, Rosehip oil	Provide structure, deep moisturization, improve skin barrier, reduce water loss, soften and smooth skin and hair.
Very-Long-Chain (C22+)	Behenic, Lignoceric	Moringa oil (behenic), Peanut oil, Jojoba oil (rich in wax esters)	Form protective, waxy barriers, lock in hydration, smooth hair cuticle, enhance conditioner performance.

How to Use This Chart in Formulation

- Combine **medium-chain oils** (like coconut or babassu) with **long-chain butters** (like shea or cocoa) for a balance of quick absorption and deep moisture.
- Add a touch of **very-long-chain oils** (like moringa or jojoba) to boost protective qualities in hair conditioners and barrier creams.
- Focus on **polyunsaturated long chains** (linoleic, linolenic) for lightweight serums and acne-prone skin, and **saturated long chains** (stearic, palmitic) for thicker creams and protective balms.

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