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Winter-squash (Cucurbita moschata D.) cv Cehualca is native from Mexico. It is cultivated in the State of Sinaloa, Mexico. This squash is rich in provitamin A carotenoids that possesses high antioxidant activity and is an excellent source of dietary fiber. There is little scientific literature about the chemical and nutritional characteristics and technological processes applied on this squash. The objective of this study was to know about the effect of extrusion and drying processes on the functional properties of winter-squash extruded flours. Squash (91.0% moisture) was pre-cooked using a high-moisture single-screw extruder, operating at different extrusion temperatures (55-95°C) and different screw speeds (15-75 rpm). After extruded the squash flour was dried at different temperatures (60-72°C). The carotenoids retention (CR), the antioxidant activity of carotenoids (AAC), water adsorption index (WAI), polyphenolic content (PC) and antioxidant activity of polyphenolics (AAP) were analyzed. Box-Behnken experimental design and Response Surface Methodology for data analysis, were used; and the Response Surface Methodology for the optimization process was used. The results showed that both processes presented a significant effect on the responses CR (12.15-47.59%, p≤0.05), the AAC (7.9-73.5%, p≤0.01), and the WAI (9.46-23.65 g-aa/g-ss, p≤0.05). The extrusion process presented a significant effect on the responses PC (0-15, p≤0.01), and AAP (18.78-46.96%, p≤0.01). In the optimal conditions (ET=90°C, SS=15 rpm, DT=60.5°C). The extruded squash flour presented good functional properties, with CR=76.35±1.19%, AAC=62.64±10.44%, and WAI=22.17±0.75 g-aa/g-ss. The final product can be used as an ingredient and/or as a food because of its physicochemical and nutraceutical properties.