Whey protein concentrate (WPC) has attracted interest for the development and commercialization of healthy products, since it may be used as a fat substitute in ice creams formulations, with the advantage of being an easily digestible protein, rich in essential amino acids, and is considerable low fat. The objective of this study was to development an ice cream based on WPC previously fermented with Kefir and perform a sensory evaluation of the product. Ice cream base formulations were prepared containing water (67%), sucrose (8%), glucose syrup (4%), WPC-35 (20%), emulsifier (0.5%), stabilizer (0.5%) and 1% flavoring. The ingredients were mixed and pasteurized at 85°C/15min before making the ice cream. Sensory analysis was conducted by applying acceptability tests. Results showed that WPC fermented by Kefir can be used to develop an ice cream with interesting properties and good acceptance by the panelists. Despite fermentation step during processing, ice cream presented low acidity (60ºD), corroborating with the results of sensory analysis, which showed a high acceptability index (AI) for the attributes: appearance (72.11%), taste (79.33%), aroma (67.88%), texture (62.88%) and overall score (73.55%). Acceptability index over 70% indicates that product was approved. Based on the results, it is possible that WPC promoted a better solubility and emulsion stability of whey protein which, in turns, resulted in a smoother feeling of the ice cream. Therefore, the use of Kefir, and WPC as fat replacer, in ice cream formulations, can be successfully performed, resulting in a functional, low fat (0.9%) and low-lactose food.