[0006] In an additional embodiment, the invention is directed to a method of preparing powdered exosomes. The method comprises centrifuging bovine milk to form a lipid fraction top layer, a whey fraction middle layer, and a first pellet of cells and debris, separating the whey fraction and centrifuging the separated whey fraction to remove additional fat, casein aggregates and debris and form a substantially clear whey fraction, microfiltering the substantially clear whey fraction to remove residual debris, centrifuging the microfiltered whey fraction to obtain a pellet containing exosomes, incubating the exosome-containing pellet in aqueous medium to dissolve the pellet without disrupting exosome bilayer membranes to provide an exosome suspension, and drying the suspension to obtain the powdered exosomes.

[0007] In another embodiment, the invention is directed to a method of preparing a powdered nutritional composition. The method comprises dry blending a powder composition comprising protein, fat, and carbohydrate with powdered exosomes isolated from bovine milk.

[0008] In further embodiments, the invention is directed to a method of lowering a risk of developing insulin resistance, prediabetes, or diabetes in a subject, or treating insulin resistance, prediabetes, or diabetes in a subject. The method comprises administering to a subject at risk of developing, or having, insulin resistance, prediabetes, or diabetes the exosomes according to the invention or the nutritional composition of the invention, wherein the administered amount of exosomes is effective to lower the risk of development of, or treat, respectively, insulin resistance, prediabetes, or diabetes.

[0008a] In further embodiments, the invention is directed to a use of the nutritional composition as described herein, or the powdered exosomes as described herein, in the manufacture of a

medicament for lowering a risk of developing insulin resistance, prediabetes, or diabetes in a subject, or treating insulin resistance, prediabetes, or diabetes in a subject.

[0008b] In further embodiments, the invention is directed to a nutritional composition as described herein, or the powdered exosomes as described herein for use in therapy.

[0009] The bovine milk-isolated exosomes of the invention are advantageous in providing bioactive agents in a convenient and stable form, and, in certain embodiments, in a nutritional