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(54) Title: LYOPHILIZED LIVE BORDETELLA VACCINES

(57) Abstract: Formulations of lyophilized *Bordetella* bacteria which are stable for at least two years when stored at temperatures between -20° and 22.5°C, and which exhibit sufficient bacterial viability and potency to be used as a live vaccine are made by harvesting *Bordetella* bacteria from a culture at an OD600 between 0.4 and 1.6; mixing the harvested *Bordetella* bacteria with a lyophilization buffer comprising 5-65% by weight a cryoprotectant sugar and having a temperature between 2-35°C, wherein the ratio of harvested *Bordetella* bacteria to lyophilization buffer is between 5:1 and 1:5 by volume; lyophilizing the mixture of the *Bordetella* bacteria and the lyophilization buffer; wherein the hold time between the harvesting and lyophilizing steps is less than 48 hours; and collecting the lyophilized *Bordetella* bacteria.



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