We used the production and operation data of GZ Yanjing Beer Company (China) and used Vensim 8.1.0 software for model analysis. Then we have the inventory of each logistics unit in the supply chain and simulated them.

From the simulation of using collaborative management, the system-related variables such as replenishment quantity, order quantity, replenishment quantity and wastage of retailers all experienced a sudden increase, while wholesalers and manufacturers increased almost at the same time, and the increase range was nearly the same. The simultaneous occurrence is due to the adoption of collaborative management control and the accurate transmission of demand information to each node of the supply chain through the collaborative platform without any information delay. The reason for the consistent increase is that the collaborative platform accurately transmits the demand information to each segment of the supply chain, ensuring that the information is not expanded or distorted during the transmission process within the supply chain.

It can be found that the overall predictive management control with collaborative platform is lower than
that without collaborative platform from the simulation results. The inventory of each node has an increasing trend in the absence of the traditional management strategy of collaborative management, which indicates that the use of collaborative inventory management control of supply chain is effective for the beer industry and can effectively inhibit the generation of bullwhip benefit.

The simulated fluctuations of retailers, wholesalers, and manufacturers adopting the supply chain collaborative inventory control system are relatively large because the collaborative platform predicts the inventory at each node of the supply chain. The collaborative platform provides the expected inventory. When the expected inventory is lower than the expected inventory, an ordering activity will take place, and when the expected inventory is higher, the ordering activity will not be taken. At the same time, we found that the expectation of inventory fluctuation is zero. In the long-term simulation, the inventory fluctuates above and below the expected inventory, but the fluctuation range tends to be stable.

References