

Hybrid Incubator Technology For Dairy Industry



Abstract

With the development of technology and the need to conserve energy in order to ensure a greener environment, organizations across the globe have focused in reviewing and altering traditional methods of carrying out various activities related to the line of business the organization indulges in. When considering the dairy industry where a considerable amount of processing takes place, a large sum of energy in different forms are being converted to forms that are not advantageous to the company. Therefore it is required to identify such areas of energy wastage in order to create and innovative, profitable solutions.

The main focus within this project would be to minimize the energy losses while increasing productivity or resources in a profitable manner pertaining to the incubation process of the industry. As the title of the project 'Hybrid Incubator Technology' states, multiple heat sources are to be used in order to provide heat to the incubation area in order to be maintained at the desired temperature suitable for product processing. The additional heat source, which in this instance would be steam is to be used together with the existing electrical heating system that is currently used widely within the dairy industry. The system is to be designed in a manner that the steam produced from the boilers within the boiler room is used for incubation at all instances that steam is not required for other production activities. When steam is required for production activities the incubator is to be shifted back to heating through electricity.

Cooling load and heat exchanger calculations have been carried out in order to obtain a numerical figure of the energy needed in order to increase temperature within the incubator area. Furthermore calculations have been carried out to obtain the steam energy produced by the boiler with regard to the energy lost when conveyed through steam lines. A financial analysis has also been performed in order to highlight the profitability of adopting the above mentioned Hybrid Incubator Technology. A risk analysis together with the modification design constructed through computer aided design software has been included in order to highlight the hazards related to the modification technology and for the ease of visualizing the modification. Conclusions of the calculations and designs generated have been discussed together with future developments and modifications that could be carried out pertaining to incubator technology have been sited within the project in order to develop, innovate and increase heat source efficiency of the incubation process within the dairy industry.