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Without Cooling, Most Modern Society Would Crumble Says Cold-Chain Expert Pawanexh Kohli

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Captain Pawanexh Kohli is an expert on cold chain and the global food crisis, and the Chief Advisor/CEO of India's National Center for Cold-chain Development.

Kohli has awards aplenty; he was made 'Cold-chain Personality of the Year' 2012, lauded for 'Exemplary Thought Leadership' 2013, for being one of the '25 Most Talented Rural Market Professionals of India' and given an 'Agribusiness Leadership Award,' both 2014.

He says that the cold chain may be essential for our future food security at the global level. But first I needed him to tell me what a cold-chain is, anyways.

Captain Pawanexh Kohli speaking at a Cool Logistics Global Conference. Photo: National Centre for Cold- Chain

Singh: **What is a cold- chain?**

Kohli: Here's an example from ancient India lore, when there were men and women known to meditate or do penance for extended durations. On realizing the frailty of the human body- that it could not survive without food or water for longer than a week or so- they solved that problem by climbing to the top of the Himalayas. Then they stripped themselves of clothing before entering into the meditative stage. Exposure to the chilling cold reduced their biological demands, their circulation and respiration, allowing them to remain longer at whatever they were contemplating. They effectively bought time, with the body living for weeks only on fresh air; far longer than is possible normally.

This is exactly why we use refrigeration today. We use the cold to stretch the usable life of what otherwise would rapidly perish. Such use of cool temperatures is also evidenced in medieval Peru for potatoes, and elsewhere.

So this is the principle that applies to meats and foods.

The cold-chain in the context of our food supply is mainly about controlling the life inside and around food. In the case of post-mortem food products like meats and fish, these are cooled to much below freezing temperatures so that the bacteria living on the surface, which normally would decompose the inert flesh, are kept in abeyance. In this case, the cooler the temperature, the better, and if the bacteria also dies, that's great.

On the other hand, whole produce, like fruits and vegetables, is mainly consumed while it remains fresh and living. When handling fresh farm produce, the cold-supply-chain's primary job is to keep the produce alive, albeit retarding its living activities. There is a fine balance between retarding the ageing process and killing the living tissue. Each fruit and vegetable has its individual chill point or temperature sensitivity. Just a degree below its chill point can cause damage and demise. Unlike in the case of meats, these also continue to breathe and live, so providing oxygen and evacuating their respiratory gases is equally important.

It is yet a different ball-game in the case of vaccines where cold-chain technology is also used.

What's the advantage of cold chain?

It's the sole method by which we can safely transport fresh produce grown in faraway regions to consumption clusters around the world. As our civilization developed, we created high density pockets of consumers. The producing areas shifted to where resources are more suitable. So we are headed towards a scenario where food will be grown where it is most sustainable to do so. The demand will be concentrated in faraway urban centers, and the time between the two will exceed the natural life cycle of the perishable produce. Cold-chain alone bridges this gap by buying time to safely reach the consumers, in quality and quantity. Without the proper application of cooling, most modern society would crumble, not just failing the food and medical supply lines, but also disrupting the data management and human comfort systems.

You recently spoke at the UK's House of Lords and participated in a Policy Commission on this subject. Is the UK positioned for a future ready cold-chain?

The UK was the birthing ground of the industrial age, and even now, it may find a place on the refrigeration technology end. I see the scope for some really disruptive work underway. However, it would be more reassuring to see the UK taking a value chain system approach on this subject. I did find attention being paid to the subject of cooling, but am not sure if the value chain system was understood fully. The average person may not realise it, but the tap on the food supply is slowly turning tight. The UK is not self-sufficient in food production and already imports close to 50% of its needs. Its economic prosperity is driven to an extent by trading in food, while everyone is becoming conscious of localised food security. Therefore, development in this space is better placed if it crosses borders; I think the UK needs to do more at their source of food; mainly Africa these days. By comparison, the USA has developed direct expertise with fresh food handling and long distance logistics. There are certain value systems that cannot exist without refrigeration, so a visionary approach would be opportune, and will serve everyone's wellbeing. While refrigeration is an important aspect, that expertise alone will not do the trick.

You're saying refrigeration is key?

Not just refrigeration, but the understanding and managing of the supply chain that it goes into. A simple example; if 10 persons are stuffed in a sealed air-conditioned car, while they may find the chilled air comforting, they would eventually suffocate in the carbon dioxide they exhale in just a few hours; unless they regularly open the fresh air intake. This same is also applicable when handling fresh produce in the cold-chain. Then there are other concerns inherent to refrigeration, like the effect of dehydrating the goods, or crystallization, which can tear the tissue including meats, the damp and disease it causes, its inadequacy per other factors, its after-effects, etc.

Isn't this all getting way complicated now?

Look- it is about caring for the nourishment, and at times, the living force that resides in our food. India, UK, and the world need to appreciate the key aspects and the importance of the kind of care and handling that goes into our food supply chain. It involves biology, physics, chemistry, logistics and time management and is amongst one of the most multi-disciplinary trades. Of utmost importance is that humankind realizes that we need to learn to harness the cold better. Though its uses are old, modern techniques are fledgling and we have quite some ways to go.

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