



Revolutionary BioDevice System for Vaccinating One Hundred Thousand Chickens per Hour Eliminating the Need for Antibiotics



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"We will revolutionize the Poultry Industry, One Chick at a Time!"
- Ramin Karimpour

Interview conducted by:
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CEOCFO: Mr. Karimpour, what is the concept behind Applied LifeSciences & Systems?

Mr. Karimpour: Today the poultry industry is going through a major transition towards production methods including antibiotic free and organic. That will, in addition to other long term economic effects, also potentially shift animal disease dynamics and is already creating a demand for better vaccines and means of effective vaccine delivery for preventative medicine. Regulatory agencies have become very active trying to get livestock producers to remove antibiotics from the production cycle. In particular with regard to poultry, which includes ducks, turkeys and chickens, as well as 'layers' or table eggs, that we eat for breakfast. We consume almost seventy billion chickens a year. On a more specific level, diseases with either high economic impact, such as coccidiosis because of the impact on production efficiency, or diseases with rapidly changing dynamics –variant viruses such as Reo, IBV, etc. with no cross-protection, or pathogens of public health significance such as salmonella and campylobacter that also carry high economic impact (risk of outbreak, publicity, etc.) all remain top concerns and priorities for poultry integrators. When you remove antibiotics from the production cycle, the chicks get sick and diseases are introduced, such as Coccidiosis, salmonella, Newcastle and others. This can increase mortality by almost three hundred percent. This leaves the producers with a loss of about nine to ten billion dollars a year with regards to loss of production and loss of efficiency. That is why when you go to the supermarket and buy antibiotic-free chicken you pay more, about four dollars per pound for an antibiotic-free breast of chicken.

CEOCFO: Where does ALS-S come into play?

Mr. Karimpour: We will revolutionize the Poultry Industry, One Chick at a Time! On day-one of the chick's life, to provide a better vaccination process to help eliminate antibiotics during the growth period. Unfortunately, even though animal health companies have already created many vaccines against all the big diseases such as Coccidiosis, there are no effective means of mass delivery to the billions of chickens every year. The current method is mass sprayers of vaccines, which do not get to all the chicks, and those that are vaccinated actually get the rest that are not vaccinated sick much faster. As a result, the best way to protect all chicks is to ensure that you can deliver vaccines to each chick. ALS-S has the technology to individually vaccinate all chicks, at one hundred thousand per hour.

CEOCFO: How do you do that?

Mr. Karimpour: That is the "secret sauce."

CEOCFO: Can you give us a little detail?

Mr. Karimpour: We have a system that the chicks enter on the day they are born and we individualize them. Using robotics and vision technology, we inspect the chicks and can target vaccine delivery to the facial are where it will have the greatest uptake.

CEOCFO: *Is the technology easy to understand? How do you fight back against skepticism?*

Mr. Karimpour: It is quite simple, in fact. And as we have been speaking to our target customers, they are in agreement that what we are doing makes sense, and is the natural next step in the evolution of the poultry industry. To our skeptics, which are few, and in fact, we have not encountered any, yet! Our Board of Advisors and our management team is deeply embedded in the poultry industry, and includes the former president and CEO of Perdue Farms, the former president of Merial Select, Inc., Sanofi Animal Health, and the former president of Foster Farms. We have met with many of the leaders in the poultry industry they are all excited about our solution and supporting our development. We also have the support of the National Science Foundation (NSF), in the form of a grant.

CEOCFO: *Where are you in the development process?*

Mr. Karimpour: At the present time we are making our first prototype. We expect to be conducting field trials this summer. We are probably about two and a half years away from full commercialization.

CEOCFO: *What have you learned so far as you have started working on this project? What might have changed from the original concept? What have you found that is so encouraging for you?*

Mr. Karimpour: We have tested a few things so far. First, the chicks have been very cooperative! They are meeting our expectations with regards to their behavior. The chick needs to behave in a certain way for us to be successful. Another element we have to be mindful of is biological, specifically vaccines. We need make sure that the vaccines are the precise amount, the precise location, and the precise delivery means. So far, we have had very good outcomes from our first concept study. We have made some fixes and have tested it in hatcheries. The second key learning from our potential key customer's veterinarians is that with the removal of antibiotics, diseases that they thought had disappeared, from the US in particular, have actually reappeared, in different variations. For example, there is a reemergence of Infectious Bronchitis. What is known as Newcastle, which did not exist for a while in the US, is becoming big. Potential customers have shared with us that they not only want to use our system for the tougher viruses and fungi that exist now, but also other diseases that are now coming back as antibiotics disappear.

CEOCFO: *Are you using vaccines that are available today? Are you combining vaccines?*

Mr. Karimpour: Yes. These vaccines have been around for about forty years. We are not doing anything with the vaccines other than delivering it properly.

The successful way to deliver vaccines to one hundred percent of the chicks was to use manual labor to deliver to every individual chick. That is very costly, of course and almost impossible to find an adequate amount of labor and hours in the day. When you are doing sixty-seven to seventy billion chicks a year you need about seven hundred million plus man hours to vaccinate. That is almost impossible to find nowadays. And the cost of chicken would go through the roof! We are automating this process. We are creating a device that will do the job of delivering accurate and precise vaccines to each chick.

CEOCFO: *Why poultry first?*

Mr. Karimpour: We know this industry very well. We are getting a lot of interest and pressure to look into other livestock industries, specifically aquaculture, because there is no real solution out there with regards to how you vaccinate each individual fish. We have to prioritize, and therefore, we started with poultry, but we expect to expand into aquaculture in about two years.

CEOCFO: *Are you seeking funding?*

Mr. Karimpour: Yes, we are. We are currently in the final stage of making an agreement with one of the largest animal health companies in the world, where they have committed to fund about half of our project. We are also looking for external "professional investors", that being venture funds or equity funds, to join together with our strategic partners to fund the rest of the program.

CEOCFO: *What is the takeaway for our readers?*

Mr. Karimpour: Antibiotic-free is here to stay. The only appropriate and logical approach is to vaccinate all animals against potential diseases and through disease prevention eliminate the need for antibiotics.