WE ARE
LAB

LAB POULTRY SYSTEMS

New Innovations in Poultry Technology for environmental cooling, water, lighting and sanitation can improve UAE poultry productivity by 47%

Bringing consistent, predictable, high yield poultry production to the UAE.

Presented for:
Abu Dhabi Food Security Authority (ADFSA)

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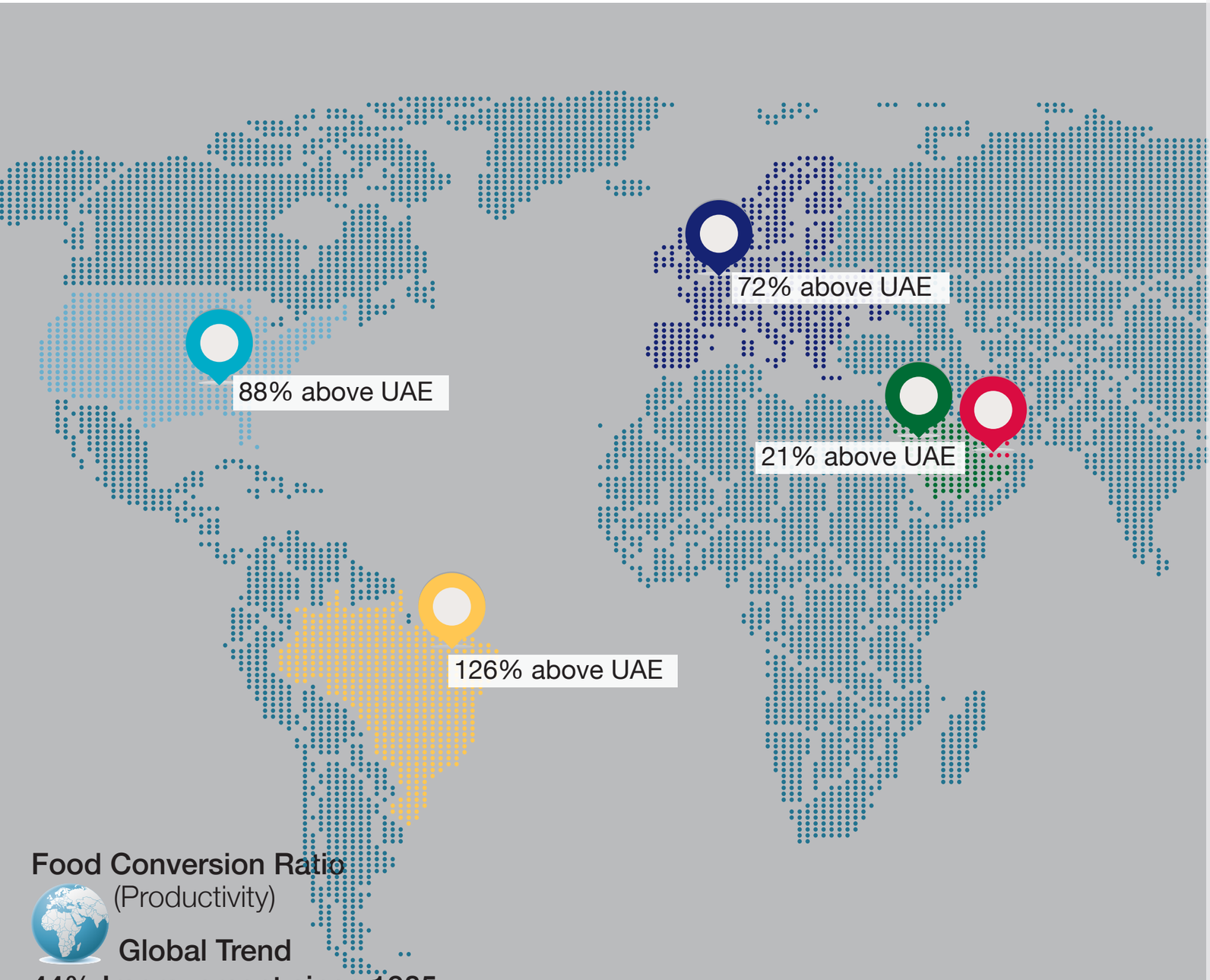
UAE POULTRY OVERVIEW

‘Poultry is the number 1 source of protein consumed in the UAE after grains’



Food Conversion Ratio
(Productivity)

Global Trend

44% Improvement since 1985
16% Further Increase projected by 2025 = Widening UAE Performance Gap

High Market Demand

- The UAE does not produce poultry at the same efficiency as other poultry countries
- The UAE eats more poultry per person than almost any other country in the world
- The UAE sells fresh poultry at a premium price per kilogram, one of the highest in the world

Poultry Supply for the UAE

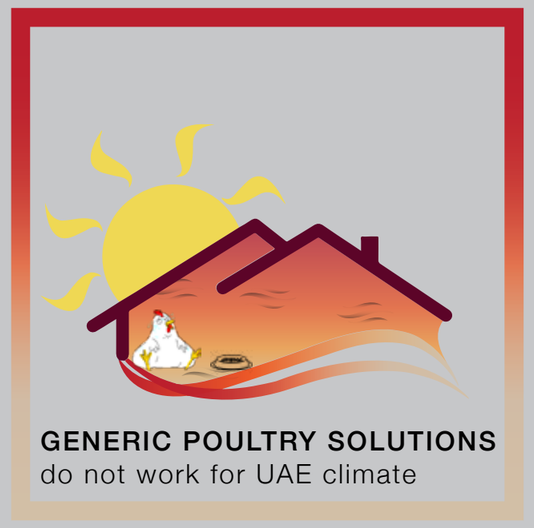
- UAE only produces 11% of the poultry its residents eat (chilled fresh)
- Oman & KSA produce 9% of UAE consumed poultry (chilled fresh)
- Brazil & the USA produce most of the remaining 80% of UAE consumed poultry (Frozen)

Food Security

- KSA has mandated it produce 60% of their own poultry (to be achieved by 2020)
- Qatar has mandated it produce 100% of their own poultry (reports achieved 2019)
- Oman is presently building 200 more sheds, to attack the UAE market
- The UAE Poultry producers are at risk of being forced out of the market due to poor local feed conversion rates, and heavy import competition

CURRENT CHALLENGES IN UAE

UAE poultry production suffers greatly from environmental challenges



Low **F**ood Consumption

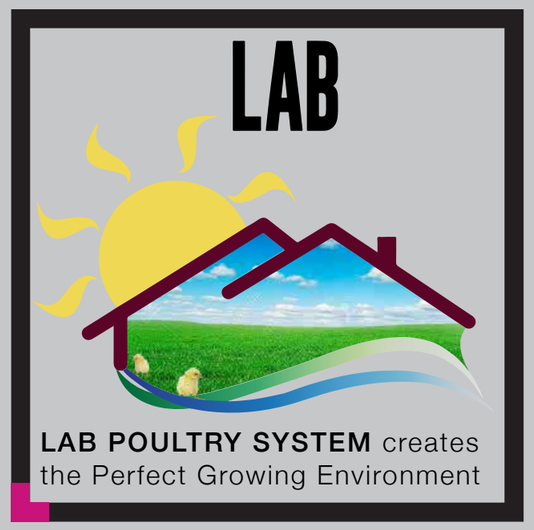
Poor **L**ighting Control

High **A**ir Temperatures

High **W**ater Temperature

Poor **S**anitation Conditions

Poor Growth Environment



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Optimum & stable air temperatures
to reduce poultry heat stress

New sanitation technology to
reduce disease and rest periods

Lower water temperatures
improving vaccine effectiveness

Close lighting control
reducing activity energy waste

Optimum Growth Environment

We have developed new technology for environmental cooling, water cooling, lighting and sanitation. This technology is being applied to UAE poultry production. Each of these technologies have been adapted to UAE poultry farming by LAB Poultry Systems.

A lack of cooling and a lack of temperature stability was identified as the biggest contribution to low UAE poultry production and was the first focus in LAB's technology development.

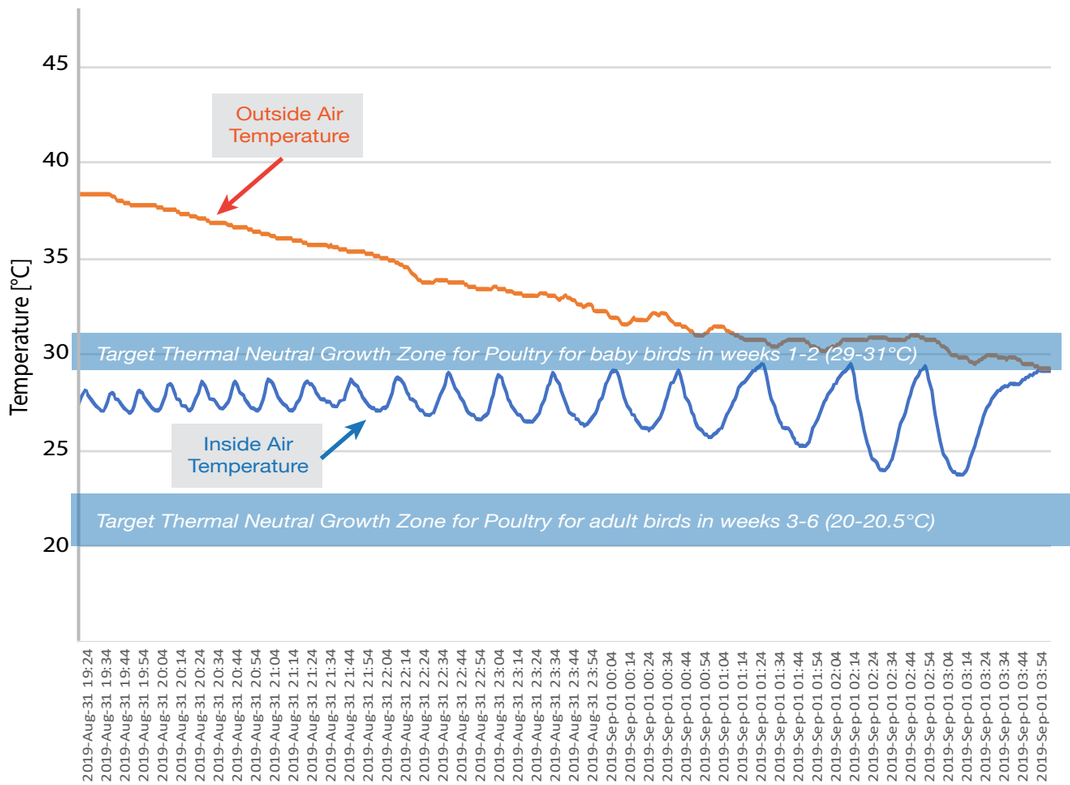
LAB's advances in cooling technology were successfully tested on Al Dahra farms in Al Ain in August of 2019.

** UAE poultry production suffers greatly from environmental challenges as detailed further in appendix B*

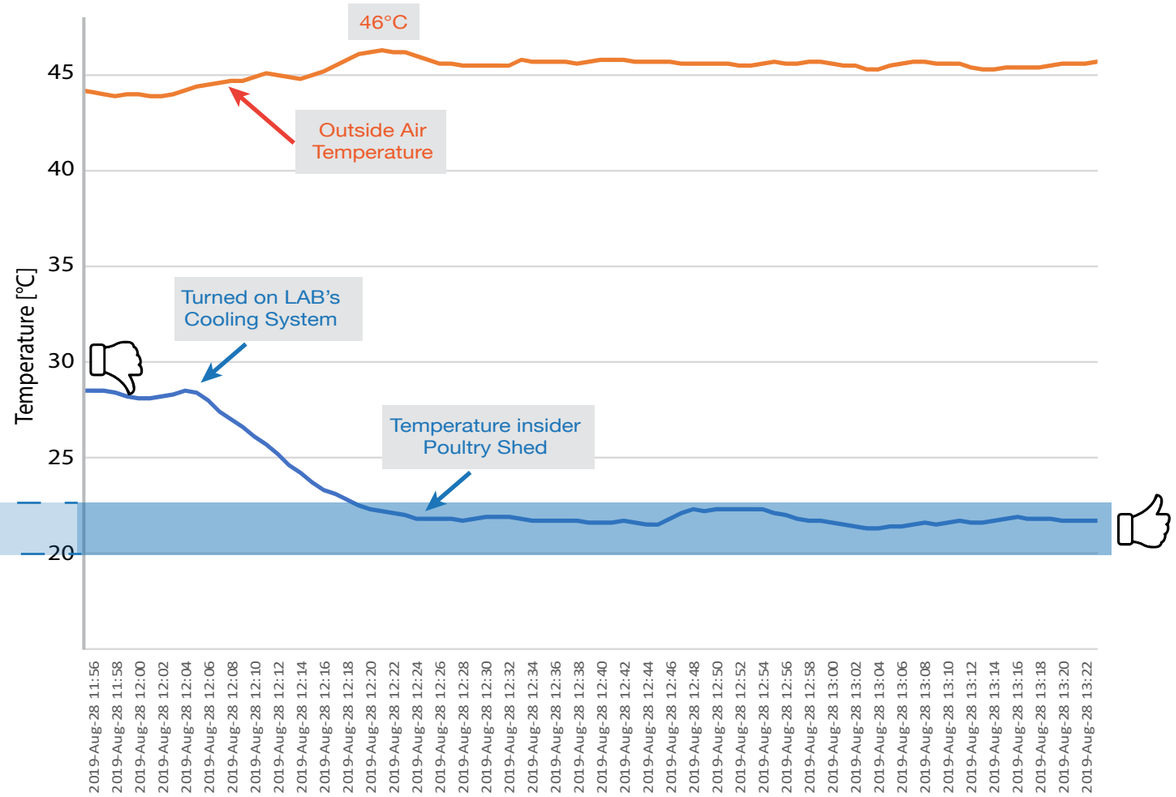
AL DAHRA POULTRY FARM TRAIL

Solving Poultry Heat Stress with High Efficiency Three Stage Evaporative Cooling

Graph 1 Findings - *Standard UAE poultry cooling systems cant hold stable and constant temperature conditions*



Graph 2 Findings - *LAB Systems can cool to lower temperatures and hold stable and constant*



- The current UAE cooling technology cannot produce consistent stable temperatures within the required 2°C temperature ranges - It cannot hold a relative constant temperature

** For more trail information please read appendix A*

- LAB's new cooling technology achieved the optimal 20°C to 22°C with an outside of 46°C
- LAB's new cooling technology can hold a consistent and stable temperature range
- The existing cooling system cannot achieve the optimal stable temperatures

LAB Poultry Systems raised 900,000 Dirhams to prove that their technology can:

1. Achieve the required optimal temps. (21-22°C) in 46°C for poultry weight gain
2. Achieve the stable temperatures that are critical for poultry weight gain

THE UAE NEEDS CHANGE IN THE POULTRY SECTOR

Summary

- The UAE has high market demand for poultry
- The UAE sells poultry at a global premium price
- The UAE has poor poultry food conversation rates (FCRs) associated with heat stress
- The UAE poultry production heat stress issue is solvable with LABs HETSEC technology

LAB Poultry Solutions

Our trial proved that we are able to produce stable temperatures as low as 21.5°C, which has been shown around the world to improve productivity by as much as 27% to 50% over existing UAE shed production runs.

We will continue to improve environmental temperatures & conditions with time and resources.

NEXT STEPS -
UAE POULTRY CENTRE OF EXCELLENCE

The Test Farm – Poultry Centre of Excellence

Our next steps are to:

- Operate a farm with 6 to 10 “mini-sheds” (smaller shed sizes)
- Install our cooling technology on 4 to 8 of the poultry sheds
- Install water coolers on 4 to 8 of the poultry houses
- Install our lighting technology on all of the sheds
- Build 2 to 3 “super-sheds” using the new sanitation technology
- Conduct R&D – in the form of carefully controlled two-shed-tests where we test variables on one shed and hold the other shed’s variable constant

Cost of building 5 mini standard sheds and 3 mini “super sheds” for a test farm:
6,970,000 AED + land + Utility infrastructure

Cost for retrofitting existing 4 large sheds into 8 “mini-sheds” and building 3 mini “super-sheds”: 5,840,000 AED (Assuming the land has utility access)

The financial feasibility study of this project shows that it can pay it’s capital cost back in under three years. *(available upon request)*

FUTURE - ROAD MAP

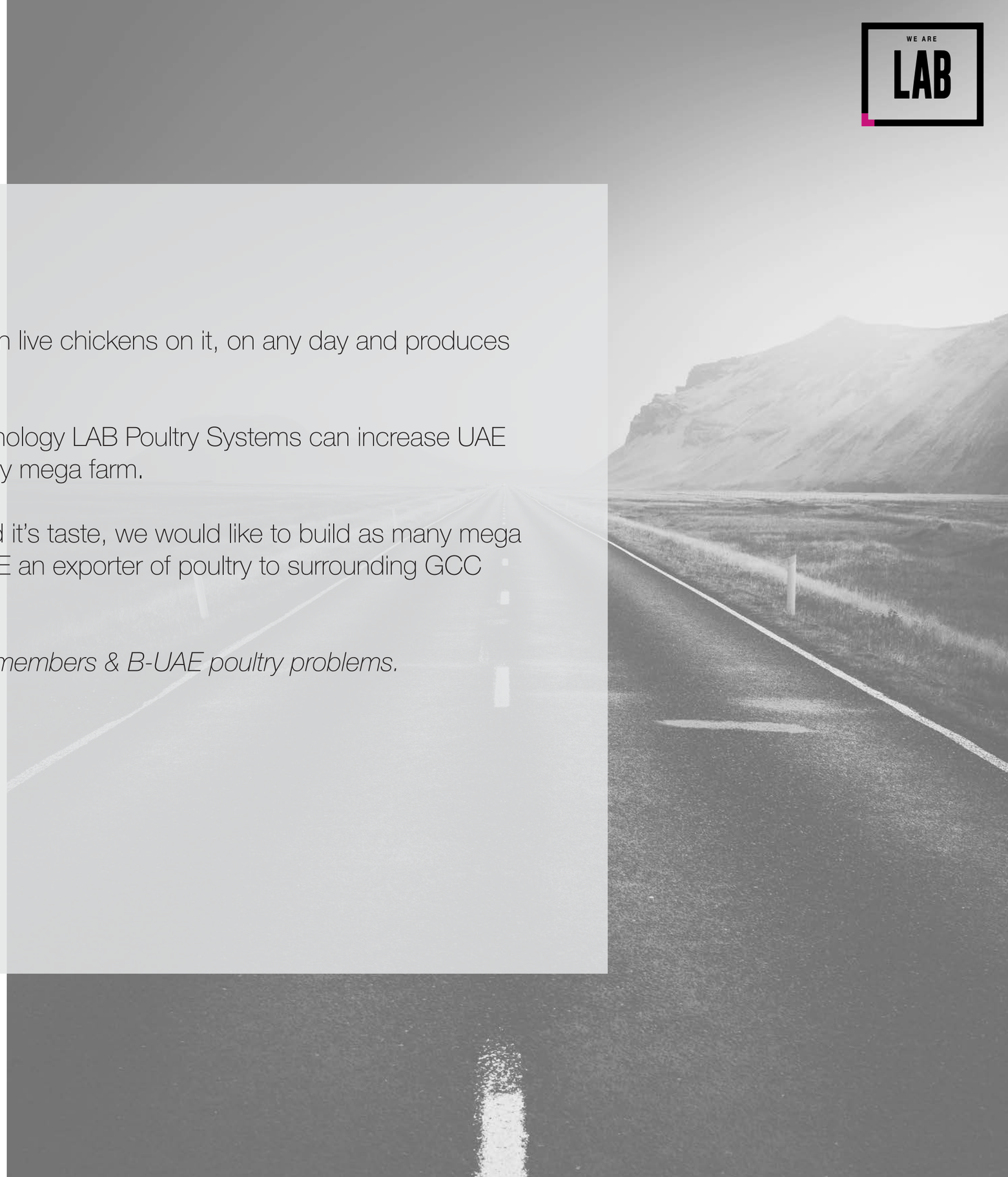
Build and Operate a Mega-Farm

Mega farm: a poultry farm that has a minimum of 1 million live chickens on it, on any day and produces a minimum of 7 to 8 million birds a year for slaughter

It is our belief after research and a trial that with our technology LAB Poultry Systems can increase UAE local poultry production by 47% with one high-technology mega farm.

If the consumer market responds well to the product and it's taste, we would like to build as many mega farms as the market will sustain and aim to make the UAE an exporter of poultry to surrounding GCC countries if possible

** For more information please read appendices A-Team members & B-UAE poultry problems.*



APPENDIX A

TEAM ASSEMBLED - NEXT and FUTURE STEPS

Christopher LaBorde
Organizer, Aerospace engineer & Technologist

- Christopher LaBorde has been a technologist in the cooling infrastructure field in the GCC for the last six years
- Christopher is a US trained Aerospace Engineer that has spent his career in new technology development in the cooling field as well as other fields, including the medical industry, the drilling industry and the liquid infrastructure industry (city water works)
- Christopher sees this project resulting in mega farms that secures the UAE's food security needs

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Neil MacDonald
Design & Construction Specialist & AC Technologist

- Neil MacDonald has been a large project construction specialist and an AC specialist in two different careers
- Neil has led large projects in Abu Dhabi such as phase 1 of Khalifa Port ($1.5 billion budget) as the project director
- Neil has been in charge of environmental controls strategies for prestigious projects such as The National Gallery and the Royal academy of Arts in London where many of the most precious treasures of modern civilization are kept and preserved.
- Neil has also designed environmental controls for medical facili ties such as the Roslin Institute (First kidney transplant & "Dolly" the sheep – the first cloned animal)
- Neil sees this project resulting in mega farms that secure the UAE's food security needs

Thierry Schlagden
MBA - CFO & GCC Financial Analyst

- Thierry Schlagden was a professor of finance, an advisor to GCC families and head of structured assets at Beyond Solut ions
- Thierry has been part of large projects with a wide range of scope from restructuring divisions of the French aerospace company Airbus to creating a national finance plan for high speed rail systems in the GCC
- Thierry is a valuable member of our team that sees this project result in mega farms that secure the UAE's food security needs time to get it operating at the highest level of efficiency possible

Dr. Mustafa Eteer MD PhD - Poultry Mega Farm Farmer & US infectious disease

- Dr. Mustafa owns and manages the largest poultry farm in Libya
- His farm controls 90% of the poultry market of Libya through its control of the country's parent and feed stock birds.
- His mega farm has up to 3 million chickens on it at any given time.
- His farm is fully vertically integrated with its own state-of-the-art feed mill, slaughter house and distribution network
- Dr. Mustafa sees great potential in building a high-technology mega-farm in the UAE and has committed to whatever it takes of his time to get it operating at the highest level of efficiency possible

APPENDIX B

UAE POULTRY PROBLEMS

Key issues slowing poultry in the UAE down

UAE Poultry Environmental Heat Stress

- For years the high heat stress in the UAE have been said to be the reason for the UAE only producing 1.1 out of every 10 chickens that are consumed in country
- Advances in cooling technologies have traditionally been declared too expensive for the poultry industry but recent advances in technology have changed this
- LAB Poultry systems has developed a cooling system for poultry sheds that is economically viable for reducing heat stress in the UAE (20°C internal shed temps)
- Maintaining the precise stable temperatures that the birds need makes them healthier, makes them grow faster, allows for more birds to be in a shed, and reduces mortality
- LAB technology reduces cost per kilogram and makes poultry sheds more productive
- LAB technology reduces the water requirements for each bird

APPENDIX B

EQUIPMENT INSTALLED

Trail : Equipment Installed

High Efficiency Three Stage Evaporative Cooling (HETSEC)

Equipment and system installed

At Al Dahra Organic Poultry Farm
Trail August - 2019

Al Dahra Poultry Farm
Is a recently added division of Al Dahra farms, one of the larger dairy and vegetable producing farms in the UAE located in Al Ain, owned by His Highness Hamdan Al Nahyan.
The poultry division currently consists of 8 identical sheds with intentions of expanding and growing in the market. Currently Al Dahra poultry farms produces a premium organic product for the UAE market.

Shed stats

- Constructed in 2018
- Conventional wet-wall cooling system
- Dimensions: 13m x 30m
- 5,000 birds / shed
- 1.4 kg birds
- 18kg per square meter bird density

APPENDIX B

WATER PROBLEMS - TEMPERATURE

- Traditionally there are two water problems with UAE with poultry;
  - High water demands required for cooling (LAB cooling technology improves this)
  - Drinking water temperatures cause heat stress for the bird & kill antibiotics
- In the UAE it is customary for poultry sheds to deliver water to sheds through above-ground piping (or shallow buried close to the ground surface) for visual leak inspections of the water infrastructure.
- The problem with above ground or shallow buried systems is that the water can be delivered to the sheds at very high temperatures between 45°C to 50°C.
- It is allowed to cool a little bit in tanks the sheds for a period of time but this unfortunately creates a heater and further adds heat in the sheds
- The warm water is then delivered to the birds at a temperature significantly above their body temperature and causes additional heat stress to the birds
- The warm water also kills any form of live medical intervention such as vaccines and antibiotics given to the birds for their health and the health of their consumers.
- LAB Poultry Systems uses High Efficiency Three Stage Evaporative Cooling (HETSEC) systems to reduces the of cooling water and systematically reduces the cost per kilogram of poultry making the farms

APPENDIX B
ILLNESS / DISEASE PROBLEMS

- In recent years the UAE poultry houses have been experiencing issues with diseases
- One problem with disease we have already addressed is that the birds have trouble with the heat and develop weak immune systems
- Another problem that we have talked about is that the antibiotics and vaccines are killed by hot drinking water.
- A third factor for disease is the design of the poultry house because UAE poultry houses harbor diseases because of the way they are constructed
- UAE poultry houses currently require large rest periods of time between bird cycles to let pathogens die off (21 to 28 days)
- Traditionally chickens are grown from a chick to a full sized bird in 28 to 30 days, when you add a 21 to 28 day “rest” period to the cycle time you have 49 to 58 day cycle times.
- This means that only 6.4 to 7.4 flocks can be raised in a year in a UAE shed under ideal conditions.
- LAB poultry systems has found economic ways to build poultry sheds in the same way that hospitals build surgery centres. These building techniques will reduce the rest period from 21 to 28 days, down to 3 to 4 days.
- This will allow for up to 11.5 growth cycles a year
- This technology reduces cost / kilogram by reducing the load of fixed costs of the assets and makes the farm more productive

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