Hangzhou Langtuo Biotechnology Co Ltd
Intelligent Special LED lighting expert for Animal husbandry
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Make lights great for animals
灯具损耗不着急，品质可靠光衰低，加光耗电不着急，超低功率省电力，多层养殖不着急，亮度均匀产蛋齐。鸡群产蛋不着急，特种光谱高峰奇，更多品种不着急，浙大朗拓全搞定。日龄变化不着急，控光变光随你意，开灯关灯不着急，渐明渐暗无应激。电压波动不着急，恒流电源频闪抑，整栋光控不着急，电源进灯风险低，冲洗喷雾不着急，三防到位水无迹。
Hangzhou Longtuo Biotechnology Co., Ltd. is a professional science and technology enterprise who focuses on research the special LED lighting products for animals, as well as design and planning of lighting system for large scale farms. The core R&D team is led by professors of Zhejiang University who and their Ph.D. students have worked closely with Institute of Semiconductors, Chinese Academy of Sciences to explore the science of light for a decade.

Currently, Hangzhou Longtuo Biotechnology Co., Ltd. owns two international PCT patents and thirteen national invention patents. The “Langtuo” species-specific lighting systems, consist of special spectrum, optimized control strategy and lighting space design have been proved to be capable to improve animals’ hormone levels, and make animals happier, healthier and more productive. In 2013, the company received an award of "Global SSL showcase Top 100" from International Semiconductor Alliance (ISA).

The “Langtuo” brand has been highly recognized by national and international animal industries because of the advantages of performance, quality and price. More than 300 leading animal production enterprises located in 27 provinces in China have been using Langtuo’s products.

In 2017, Hangzhou Langtuo Biotechnology Co., Ltd. is engaged to enter the international market. The goal of the company is to Make Lights Great for Animals!
Mechanism

FSH, OIH, LH, Testosterone, etc. Regulating growth

Lighting

Optic nerve

Retina

Nervous impulse

Hypothalamus

Releasing

Pituitary

The efficiency of different wavelength light passing through the optic nerve to the hypothalamus or reaching the hypothalamus through the skull and intracranial organization is different.

Traditional light source, such as incandescent, fluorescent, unable to satisfy the special demands of light for animals, because of their technical disadvantage.

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low luminous efficiency</td>
<td>Uncontrollable light chromatic</td>
</tr>
<tr>
<td>High energy consumption</td>
<td>Uncontrollable light intensity</td>
</tr>
<tr>
<td>Short service life, High maintenance costs, Breakable</td>
<td>Breakable, mercury pollution</td>
</tr>
<tr>
<td>Hard to clean, dust can weaken illumination intensity</td>
<td>Frequent starting results in flickering</td>
</tr>
<tr>
<td>Long service life (&gt;100000 Hrs)</td>
<td>Hard to clean, dust can weaken illumination intensity</td>
</tr>
<tr>
<td>Safer (36 V)</td>
<td>-</td>
</tr>
<tr>
<td>High conversion efficiency</td>
<td>Controllable, dimmable</td>
</tr>
<tr>
<td>Colorful, no flickering</td>
<td>Monochromaticity (±20nm)</td>
</tr>
<tr>
<td>Green, non-pollution</td>
<td>-</td>
</tr>
</tbody>
</table>
Prof. Jinming Pan (Vice-Dean, Department of Biosystems Engineering, ZJU)

Dr. Pan is mainly engaged in the research of "special intelligent LED lighting for animal production" and "intelligent sensing of animal growth and health information". Recent years, his research work is supported by the National Natural Science Foundation of China, the High Technology Key Project of China, and the Chinese Special Fund for Agro scientific Research in the Public Interest, etc. He won the youth science and technology prize of the Chinese Society of Agricultural Machinery in 2013. He has published 24 articles in SCI/EI cited journal publications as the first or corresponding author, and obtained 17 innovation patents as the first inventor.

Prof. Hong Zhou (Vice-Dean, College of Biomedical Engineering & Instrument Science, ZJU)

Dr. Zhou mainly engaged in the research of digital instrument technology and embedded system design especially for the LED intelligent control system applied in agriculture. Recently, his research work is supported by the High Technology Key Project of China, National Innovation Fund, Zhejiang Major Special Project, Zhejiang Science & Technology Project. He has published 50 articles as the first or corresponding author, obtained 3 PCT patents and 10 national invention patents as the first inventor.

CEO Jinsong Jiang (PhD)

Dr. Jiang graduated from Zhejiang University. The research project is LED lighting environment control for animal husbandry. He spent three years in the chicken farm to research the special LED spectrum for poultry production. He has published 2 articles in SCI as the first author, obtained 1 PCT patent, and 2 national invention patents. After graduating, he founded Hangzhou LanghaoBio-technology Co., LTD with Prof. Pan. He focuses on the popularization of poultry special LED lighting technology and provides lighting solutions according to different chicken farms.
R & D

Laboratories and bases

Spectrum mechanism

Behavioral mechanism
Product

Professional design
- Waterproof and dustproof
- Quality driver
- Fast cooling, long life
- Low luminous attenuation
- Well distributed

Special spectrum
1. Enhance physique
   Lower mortality 2.15%
2. Promote absorption
   Lower feed/body gain 2.04%
   Lower feed/egg gain 2.01%
3. Increase production
   More bodyweight 1.53%
   More eggs 2.05%
4. Improve air quality
   Lower moisture content
   manual 11.3%
   Prevent the volatilization of polluted gas

Custom driver
- Noflivim
- Wide voltage
- Impact resistant

Intelligent control
- Linearly light adjust
- Timing change
- Sun rise/Sunset

Integrated system
1. AC220V, Same light intensity
2. Driver separate, Low risk
3. Integrated lamp line, Easy installation
# Product

<table>
<thead>
<tr>
<th>Varieties</th>
<th>Classification</th>
<th>Suggestion for different periods</th>
<th>Suggestion for all life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Brood</td>
<td>Growth</td>
</tr>
<tr>
<td>Layer/Breeder</td>
<td>Pink egg layer</td>
<td>LT-DB75P</td>
<td>LT-DB15P</td>
</tr>
<tr>
<td></td>
<td>Brown egg layer</td>
<td>LT-DB75P</td>
<td>LT-DB15P</td>
</tr>
<tr>
<td></td>
<td>Local layer</td>
<td>LT-DB75P</td>
<td>LT-DB15P</td>
</tr>
<tr>
<td>Broiler breeder</td>
<td>Caged/Floor</td>
<td>LT-DB75P</td>
<td>LT-DB15P</td>
</tr>
<tr>
<td>Yellow feathered chicken breeder</td>
<td>Fast type</td>
<td>LT-DB75P</td>
<td>LT-DB15P</td>
</tr>
<tr>
<td></td>
<td>Slow type</td>
<td>LT-DB75P</td>
<td>LT-DB15P</td>
</tr>
<tr>
<td>Broiler</td>
<td>Floor</td>
<td>LT-RB76P</td>
<td>LT-RB72P</td>
</tr>
<tr>
<td></td>
<td>Caged</td>
<td>LT-RB76P</td>
<td>LT-RB72P</td>
</tr>
<tr>
<td></td>
<td>Floor</td>
<td>LT-RB76P</td>
<td>LT-RB56P</td>
</tr>
</tbody>
</table>

Note: The matching scheme is for reference only. Please contact the relevant staff for details.
## D Series

<table>
<thead>
<tr>
<th>Model</th>
<th>Spectrum</th>
<th>Power</th>
<th>Scene</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT-DB15P</td>
<td>Growth</td>
<td>1W</td>
<td>Breeder/Layer (Brood)</td>
</tr>
<tr>
<td>LT-DB35L</td>
<td>Laying</td>
<td>3W</td>
<td>Layer (Laying, A-Type Cage)</td>
</tr>
<tr>
<td>LT-DB55P</td>
<td>Laying</td>
<td>5W</td>
<td>Layer (Laying, A-Type Cage)</td>
</tr>
<tr>
<td>LT-DB75P</td>
<td>Laying</td>
<td>7W</td>
<td>Breeder/Layer (Brood)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Broiler breeder (Laying)</td>
</tr>
<tr>
<td>LT-DB95P</td>
<td>Laying</td>
<td>9W</td>
<td>Layer (Laying, A-Type Cage)</td>
</tr>
</tbody>
</table>
Product

R Series

Model: LT-RB72P
Spectrum: Broiler
Power: 7W
Scene: Broiler (Brood)

Model: LT-RB76P
Spectrum: Broiler
Power: 7W
Scene: Broiler (Brood)

X Series

Model: LT-XB95P
Power: 0-9W
Scene: Whole life

Model: LT-XB75P
Power: 0-7W
Scene: Whole life

Model: LT-XB35L
Power: 0-3W
Scene: (Growth-Laying)
Model: LT-XP92P /LT-XP35P/LT-XP95P
Power: 0-9W
Scene: Whole life

Model: LT-XB73P
Power: 0-7W
Scene: Whole life of broiler

Model: LT-XB72P
Power: 0-7W
Scene: Whole life of broiler

Model: LT-XB76P
Power: 0-7W
Scene: Whole life of broiler

Matching accessories
1. Controller
2. Integrated system
3. Lifting system
(Customized as required)
Customers

浙江光大种禽业有限公司
National gene pool of local chicken strain
Details: Started from October, 2011
2 Batches, more 10,000 breeders

- More laying rate 2.05%
- Higher FCR 2.01%
- Saving electricity 80.0%
- Longer working life More than 3 times

用户名：天津**牧业集团有限公司
Details: Two houses, 1680 m² per house
Started from October, 2012
15 Batches, 200,000 AA+ broilers
Incandescent as control

- Lower mortality 2.17%
(During an occasional disease, mortality was 44.4% lower compared to control)
- Higher FCR 0.75%
- Saving electricity 75.0%
- Longer working life At least 3 times
More than 300 leading animal production enterprises have been using Langtuo’s products.
Broilers(Floor)  eg. 济南九本公司

Broilers(Cage)  eg. 威海合鑫公司

Broilers(Cage)  eg. 温氏佳润公司

Broiler breeders(Cage)  eg. 湖州温氏

Broilers(Floor)  eg. 威海福禧

Broiler breeders(Cage)  eg. 广西园丰  Broiler breeders(Floor)  eg. 北京家育
Layers (H-Type cage [8-tiers]) eg. 黄山同乐、四川绿科

Layers (H-Type cage [6-tiers]) eg. 江西圣迪乐、贵州融贵

Layers (H-Type cage [4-tiers]) eg. 北京德青源、山西晋龙、安徽荣达、河南暖洋洋、河北金凯、南通天成、江苏鸿轩、海口伟德等

Layers (Brood, H-Type cage [4-tiers]) eg. 四川圣凤源、江西华裕、广东绿杨、河北宏兴朗、南阳润鑫、沧州洪旺、泊头沃源、鹤壁韩氏等

Layers (Brood, A-Type cage) eg. 安阳德美、萧县福延、德州卓晟、河间宋氏、邓州惠农、周口祥和、襄阳红有、海阳华盛积福等
Communication