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A study on the effects of probiotic intervention on growth and development, and normal diseases in children

Submission date	Recruitment status	[X] Prospectively registered
07/11/2025	Recruiting	[_] Protocol
Registration date	**Overall study status**	[X] Statistical analysis plan
11/11/2025	Ongoing	[_] Results
Last Edited	**Condition category**	[_] Individual participant data
02/07/2026	Nutritional, Metabolic, Endocrine	[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Probiotics are defined as "live microorganisms that, when administered in adequate amounts, confer a health benefit on the host." The intestinal microbiota of infants and toddlers undergoes rapid development within the first three years of life, and during this period, the stability of the intestinal flora is insufficient and is highly susceptible to changes in feeding methods and the environment. Lactobacillus rhamnosus LRa05 is derived from fecal samples of healthy infants and has received a GRAS (Generally Recognized as Safe) no-objection letter from the US FDA for use as a regular food ingredient. Its safety assessment includes genomic analysis, in vitro toxicology tests, animal toxicology experiments, and human studies. This study aims to evaluate the effects of LRa05 intervention on promoting the growth and development of healthy infants and toddlers of different ages, enhancing their immune function, and reducing the incidence of common diseases, as well as to analyze the safety of LRa05 and its impact on the intestinal microbiota.

Who can participate?
Healthy infants and toddlers aged 0-3 years, born at full term (37-42 weeks of gestation) with a birth weight of at least 2500g but less than 4000g with an allergy risk score ≥ 6 points (high degree of sensitization)

What does the study involve?
This study is a prospective, multicenter, placebo-controlled, double-blind clinical trial. The study is divided into three randomly allocated groups:
1. Probiotic intervention group: once daily, one packet (containing 1×10^{10} CFU of LRa05 per packet)
2. Placebo control group: once daily, one packet (maltodextrin, without LRa05)
3. Breastfeeding control group: no intervention measures, only breastfed

The main observation indicators include:
- Incidence of infant eczema (primary indicator)
- Growth and development (changes in weight, height, and head circumference)

- Incidence of other allergic diseases, gastrointestinal and respiratory tract infections
- Changes in intestinal microbiota diversity and abundance
- Safety indicators (adverse event records)

What are the possible benefits and risks of participating??
Potential Benefits:
- May promote the growth and development of infants and toddlers
- May enhance immune function and reduce the incidence of allergies
- May improve intestinal health

Potential Risks:
- Possible adverse events such as nausea, vomiting, dizziness, and drowsiness
- Adverse events and serious adverse events will be closely monitored during the study period, and the incidence, occurrence time, and severity of all adverse events will be recorded

Where is the study run from?
The Baoxing County Center for Disease Control and Prevention, China

When is the study starting and how long is it expected to run for?
June 2025 to December 2027. The study enrolment period is from January 2026 to December 2026. Each participant's intervention period is 3 months, followed by a 3-month follow-up period.

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Dr Chen Ke (Principal Investigator), kechen@uestc.edu.cn

Contact information

Type(s)
Public, Scientific, Principal investigator

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Study information

Scientific Title
A prospective, randomized, blinded, placebo-controlled clinical study on the effects of Lactobacillus rhamnosus LRa05 intervention on growth and development, allergic disease incidence, and immune function in infants and young children

Acronym
Study about LRa05

Study objectives
Evaluate the effects of LRa05 intervention in promoting the growth and development of healthy infants and young children of different age groups, enhancing their immune function, and reducing the incidence of common diseases. Analyze the safety of LRa05 and its impact on the intestinal microecology.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 20/09/2025, Ethics Committee of Baoxing County Center for Disease Control and Prevention (No.1 Zhongling Avenue, Baoxing County, Ya'an City, Sichuan Province, 625700, China; +86 0835-6822027; 41541194@qq.com), ref: Keyanlunshen 2025(01)

Primary study design
Interventional

Study design
Prospective randomized blinded placebo-controlled clinical study

Study type(s)
Efficacy, Prevention

Health condition(s) or problem(s) studied
Promoting the growth and development of healthy infants and young children of different age groups, enhancing their immune function, and reducing the incidence of common diseases.

Interventions
This study is a randomized controlled blind intervention study. A random allocation table was generated by a biostatistician using statistical software on a computer. A total of 440 subjects were included, with 120 subjects in each of the 0-6 months, 6-12 months, and 12-36 months age groups. Additionally, an 80-subject breastfed control group for the 0-6 months age group was added. The random allocation table generated by the biostatistician was used for coding to meet the requirements of randomization. Subjects were enrolled strictly in the order of their random numbers and no changes were allowed. Each subject was randomly assigned to the probiotic intervention group, the placebo control group, or the breastfed control group.

The groups were divided as follows:
1) Probiotic intervention group: One packet per day (containing 1×1010 CFU of LRa05 strain per packet), starting from the day of using the probiotic product and continuing for 3 months, followed by a 3-month follow-up.
2) Placebo control group: One packet per day (containing maltodextrin, without LRa05 strain),

starting from the day of using the placebo product and continuing for 3 months, followed by a 3-month follow-up.
3) Breastfed control group: No intervention measures were taken, only breastfed.

Intervention Type
Supplement

Primary outcome(s)
Incidence of allergy in infants measured using clinical data at 3 and 6 months during the whole study

Key secondary outcome(s)
1. Intestinal health status of infants (occurrence of functional gastrointestinal diseases such as diarrhea and constipation, and functional dyspepsia syndrome) measured using clinical data at 3 and 6 months during the whole study
2. Incidence of upper respiratory tract infections in infants and young children (including frequency, duration, intensity, and medication) measured using clinical data at 3 and 6 months during the whole study
3. Changes in the diversity and abundance of intestinal flora measured using fecal 16S rRNA gene analysis at enrollment, 3 months and 6 months during the whole study

Completion date
31/12/2027

Eligibility

Key inclusion criteria
Current key exclusion criteria as of 02/07/2026:

Exclusive breastfeeding group:
1. Healthy infants and toddlers born at term (37-42 weeks of gestation) who are exclusively breastfed, with a birth weight of at least 2500g but less than 4000g, and no gender restrictions
2. The mother has no diagnosed metabolic diseases, such as diabetes, and no infectious diseases, such as hepatitis B or HIV
3. The age at inclusion is less than 7 months
4. The parents or main guardians of the infants and toddlers agree to collect fecal samples from the infants and toddlers during the study period
5. There are no diagnosed allergic diseases by a clinical physician at the time of inclusion (including but not limited to eczema, asthma, allergic proctocolitis, allergic rhinitis, hay fever, etc.)
6. The infants and toddlers have established a health record at the local maternal and child health hospital's pediatric health department and receive regular physical examinations and feeding advice and guidance from pediatric health doctors
7. The family members or main guardians promise not to add any additional probiotic products (including formula milk powder containing probiotics) to the infants and toddlers during the study period
8. The guardians of the included subjects agree to participate in this interventional study and sign a written informed consent form and are able to understand and fill out the infant and toddler diaries and other forms as required

Formula feeding group:
1. Healthy infants and toddlers born at term (37-42 weeks of gestation) who are formula-fed, with a birth weight of at least 2500g but less than 4000g, and no gender restrictions
2. The mother has no diagnosed metabolic diseases, such as diabetes, and no infectious diseases, such as hepatitis B or HIV
3. The age at inclusion is 0-6 months, 7-12 months, or 13-36 months
4. The parents or main guardians of the infants and toddlers agree to collect fecal samples from the infants and toddlers during the study period
5. There are no diagnosed allergic diseases by a clinical physician at the time of inclusion (including but not limited to eczema, asthma, allergic proctocolitis, allergic rhinitis, hay fever, etc.)
6. The infants and toddlers have established a health record at the local maternal and child health hospital's pediatric health department and receive regular physical examinations and feeding advice and guidance from pediatric health doctors
7. The family members or main guardians promise not to add any additional probiotic products (including formula milk powder containing probiotics) to the infants and toddlers during the study period
8. The guardians of the included subjects agree to participate in this interventional study and sign a written informed consent form and are able to understand and fill out the infant and toddler diaries and other forms as required

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Previous key inclusion criteria:

Exclusive breastfeeding group:
1. Healthy infants and toddlers born at term (37-42 weeks of gestation) who are exclusively breastfed, with a birth weight of at least 2500g but less than 4000g, and no gender restrictions
2. The mother has no diagnosed metabolic diseases, such as diabetes, and no infectious diseases, such as hepatitis B or HIV
3. The age at inclusion is less than 7 months
4. The allergy risk score calculated using the "Infant and Toddler Allergy Risk Assessment Form" is ≥ 6 points (refer to the "Investigation and Research on Allergy Symptoms and Risk Factors in Infants and Toddlers" by the Maternal and Child Health Center of the Chinese Center for Disease Control and Prevention)
5. The parents or main guardians of the infants and toddlers agree to collect fecal samples from the infants and toddlers during the study period
6. There are no diagnosed allergic diseases by a clinical physician at the time of inclusion (including but not limited to eczema, asthma, allergic proctocolitis, allergic rhinitis, hay fever, etc.)
7. The infants and toddlers have established a health record at the local maternal and child health hospital's pediatric health department and receive regular physical examinations and feeding advice and guidance from pediatric health doctors
8. The family members or main guardians promise not to add any additional probiotic products (including formula milk powder containing probiotics) to the infants and toddlers during the study period
9. The guardians of the included subjects agree to participate in this interventional study and sign a written informed consent form and are able to understand and fill out the infant and toddler diaries and other forms as required

Formula feeding group:
1. Healthy infants and toddlers born at term (37-42 weeks of gestation) who are formula-fed,

with a birth weight of at least 2500g but less than 4000g, and no gender restrictions
2. The mother has no diagnosed metabolic diseases, such as diabetes, and no infectious diseases, such as hepatitis B or HIV
3. The age at inclusion is 0-6 months, 7-12 months, or 13-36 months
4. The allergy risk score calculated using the "Infant and Toddler Allergy Risk Assessment Form" is ≥ 6 points (refer to the "Investigation and Research on Allergy Symptoms and Risk Factors in Infants and Toddlers" by the Maternal and Child Health Center of the Chinese Center for Disease Control and Prevention)
5. The parents or main guardians of the infants and toddlers agree to collect fecal samples from the infants and toddlers during the study period
6. There are no diagnosed allergic diseases by a clinical physician at the time of inclusion (including but not limited to eczema, asthma, allergic proctocolitis, allergic rhinitis, hay fever, etc.)
7. The infants and toddlers have established a health record at the local maternal and child health hospital's pediatric health department and receive regular physical examinations and feeding advice and guidance from pediatric health doctors
8. The family members or main guardians promise not to add any additional probiotic products (including formula milk powder containing probiotics) to the infants and toddlers during the study period
9. The guardians of the included subjects agree to participate in this interventional study and sign a written informed consent form and are able to understand and fill out the infant and toddler diaries and other forms as required

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
0 Months

Upper age limit
3 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
Exclusive breastfeeding control group:
1. Infants and young children with a history of asphyxia at birth or a history of NICU hospitalization
2. Infants and young children with birth defects or congenital abnormalities
3. Infants and young children whose mothers had high-risk obstetric factors during pregnancy, such as pregnancy-induced hypertension syndrome, preeclampsia and eclampsia, gestational

diabetes, and cholestasis of pregnancy, as well as a history of alcohol abuse or drug abuse
4. Infants and young children who had used antibiotics within two weeks before enrollment
5. Infants and young children who had diseases that definitely affected growth and development within one month before enrollment (such as pneumonia, severe diarrhea, severe constipation, severe cow's milk protein allergy, malnutrition, gastrointestinal surgery, etc., severe congenital heart disease, epilepsy, cerebral palsy, mental retardation and other neurological diseases, as well as definite genetic metabolic diseases, chromosomal diseases, and genetic diseases)
6. Infants and young children with severe primary diseases of important organs or systems such as the heart, liver, kidneys, and hematopoietic system
7. Infants and young children who had used any experimental drugs or participated in other clinical studies within three months before screening (for infants and young children under 3 months of age, the time from birth to enrollment is calculated)
8. Infants and young children who had taken probiotic products within one month before enrollment (for infants and young children under 1 month of age, the time from birth to enrollment is calculated)
9. Infants and young children who had used drugs that suppressed immune function (such as glucocorticoids and immunosuppressants) before enrollment
10. Infants and young children who were allergic to the known components of the probiotic product
11. Children with malnutrition requiring hospitalization
12. Other reasons considered by the researcher as unsuitable for participation in this clinical trial, such as those that affect the evaluation of efficacy or have poor compliance

Healthy infants and young children aged 0-6 months:
1. Infants and young children with a history of asphyxia at birth or a history of NICU hospitalization
2. Infants and young children with birth defects or congenital abnormalities
3. Infants and young children whose mothers had high-risk obstetric factors during pregnancy, such as pregnancy-induced hypertension syndrome, preeclampsia and eclampsia, gestational diabetes, and intrahepatic cholestasis of pregnancy, as well as a history of alcohol abuse or drug abuse
4. Infants and young children who had used antibiotics within 2 weeks before enrollment
5. Infants and young children who had diseases that definitely affected growth and development within 1 month before enrollment (such as pneumonia, severe diarrhea, severe constipation, severe cow's milk protein allergy, malnutrition, gastrointestinal surgery, etc., severe congenital heart disease, epilepsy, cerebral palsy, mental retardation and other neurological diseases, as well as definite genetic metabolic diseases, chromosomal diseases, and genetic diseases)
6. Infants and young children with severe primary diseases of important organs or systems such as the heart, liver, kidneys, and hematopoietic system
7. Infants and young children who had used experimental drugs after birth or participated in other clinical studies before screening
8. Infants and young children who had taken probiotic products within 1 month before enrollment (for infants younger than 1 month, the time from birth to enrollment is calculated)
9. Infants and young children who had used drugs that inhibit immune function (such as glucocorticoids and immunosuppressants) before enrollment
10. Infants and young children who are allergic to known components of probiotic products
11. Children with malnutrition requiring hospitalization
12. Other reasons considered by the researcher as unsuitable for participation in this clinical trial, such as those that affect the evaluation of therapeutic effect or have poor compliance

Healthy infants and toddlers aged 7 to 12 months:
1. Infants and toddlers who have used antibiotics within 2 weeks before enrollment
2. Infants and toddlers with definite diseases that affect growth and development within 1 month before enrollment (such as pneumonia, severe diarrhea, severe constipation, severe cow's milk protein allergy, malnutrition, gastrointestinal surgery, etc., severe congenital heart disease, epilepsy, cerebral palsy, mental retardation and other neurological diseases, as well as definite genetic metabolic diseases, chromosomal diseases, genetic diseases, etc.)
3. Infants and toddlers with severe primary diseases of other important organs or systems such as heart, liver, kidney, and hematopoietic system
4. Infants and toddlers who have used any experimental drugs or participated in other clinical studies within 3 months before screening
5. Infants and toddlers who have taken probiotic products within 1 month before enrollment
6. Infants and toddlers who have used drugs that inhibit immune function (such as glucocorticoids, immunosuppressants) before enrollment
7. Infants and toddlers who are allergic to the known components of probiotic products
8. Children with malnutrition requiring hospitalization
9. Other reasons considered by the researcher as unsuitable for participation in this clinical trial, such as those that affect the evaluation of therapeutic effect or have poor compliance

Healthy infants and toddlers aged 13 to 36 months:
1. Infants and toddlers who have used antibiotics within 2 weeks before enrollment
2. Infants and toddlers who have had diseases that definitely affect growth and development within 1 month before enrollment (such as pneumonia, severe diarrhea, severe constipation, severe cow's milk protein allergy, malnutrition, gastrointestinal surgery, etc., severe congenital heart disease, epilepsy, cerebral palsy, mental retardation and other neurological diseases, as well as definite genetic metabolic diseases, chromosomal diseases, genetic diseases, etc.)
3. Infants and toddlers with severe primary diseases of other important organs or systems such as the heart, liver, kidneys, and hematopoietic system
4. Infants and toddlers who have used any experimental drugs or participated in other clinical studies within 3 months before screening
5. Infants and toddlers who have taken probiotic products within 1 month before enrollment
6. Infants and toddlers who have used drugs that inhibit immune function (such as glucocorticoids, immunosuppressants) before enrollment
7. Infants and toddlers who are allergic to the known components of probiotic products
8. Children with malnutrition requiring hospitalization
9. Other reasons considered by the researcher as unsuitable for participation in this clinical trial, such as those that affect the evaluation of efficacy or have poor compliance

Date of first enrolment
01/01/2026

Date of final enrolment
31/12/2026

Locations

Countries of recruitment
China

Study participating centre
Baoxing County Center for Disease Control and Prevention
No.1 Zhongling Avenue, Baoxing County, Ya'an City, Sichuan Province
Yaan
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625700

Sponsor information

Organisation
Baoxing County Center for Disease Control and Prevention

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be stored in a publicly available repository, Clinical Trial Management Public platform://www.medresman.org.cn/login.aspx. Original data will be uploaded within 6 months after the end of the trial.

IPD sharing plan summary
Stored in publicly available repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet			11/11/2025	No	Yes
Statistical Analysis Plan			11/11/2025	No	No