

# Dedication

*To my Mother soul .....*

*My Father .....*

*My Wife and Sons .....*

*My Aunt Alia .....*

*Gotpy*

## **Acknowledgement**

*Firstly thanks to God for giving me strength and patience to fulfill this study*

*I would like to express my deep thanks to My Supervisor Dr . Mohammed Altigani Salih for guidance and useful suggestions.*

*Aim also thank full for the senior staff of Arab Poultry Production and Processing Company for unlimited help.*

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## **Abstract**

The present study was conducted to evaluate the improvement of fans and pad evaporative cooling of poultry houses and its effect on Broiler Breeder performance .The Broiler breeder houses used in the study is owned and operated by Arab Poultry Production and Processing Company. The objectives of the study are maintaining better environmental conditions in order to attain the maximum production and therefore increase the rate of economical returns for the company.

Eight closed poultry houses capacity 30.000 birds (3750 birds \house) were used to collected the date during the rearing and the production periods. The rearing period started with one day old chicks and continued for 24 weeks while the production period started at the end of rearing and continued for 40 production weeks. The ventilation and cooling system used in these houses is the exhaust fans and pad evaporative cooling system in which wetted pad banks (12 m length X 0.91 m high ) are located along the middle of both side walls of the house while six teen exhaust fans power rate (10,000 m<sup>3</sup> /h ) placed in beginning and end of the house . Due to negative pressure created by the exhaust fans, ambient air is forced through the wetted pads, where it is evaporative cooled and flows the longitudinally through the house towards

the exhaust fans. The cooling performance was observed to be inefficient, the inside temperature was high and adversely affecting in broiler breeder performance. Accordingly, improvement of fans and pad evaporative cooling was done in four houses called Rehabilitated houses, in which the wetted pad bank area was increased (12 m length X 1.90 high) and the banks were located in beginning of both side walls of the house while six exhaust fans power rate (34000 m<sup>3</sup> /h) are distributed in the end of house. Rehabilitation of poultry houses resulted in significant (P <.01) drop in the inside temperature throughout the rearing and the production period. The drop in temperature was about 4C<sup>0</sup> during the winter season and 3 C<sup>0</sup> during summer season. Improvement in inside temperature in rehabilitated houses resulted in significant (P<0.01) increase in feed intake for female and male broiler parent stock during the rearing period and consequently this resulted in significant (P<0.01) improvement in body weight for both sexes .The results also lead to significant (P<0.01) drop in mortality and less percentage of culled birds .

In the production period the improvement in inside temperature in rehabilitated houses resulted in significant (P<0.01) increase in feed intake, egg production, egg weight and fertility. And these results lead to significant (P<0.01) drop in the second class egg.

This improvement in ventilation increased the economical rerun by 8.2% per cycle for the rehabilitation houses, and decreased in total costs 4.38% to the non rehabilitation houses .

## Arabic Abstract

اجريت هذه الدراسة لتقييم التحسين فى مراوح التهوية وخلايا التبريد واثرها فى اداء امهات التسمين . الحظائر المستخدمة فى التجربة مملوكة وتدار بواسطة شركة انتاج وتصنيع الدجاج العربى . والهدف من التجربة هو تحسين المقومات البيئية المثلى للطيور لبلوغ اقصى معدلات انتاج لتحقيق اكبر عائد اقتصادى .

ثمانية حظائر مغلقة بسعة ٣٠,٠٠٠ طائر (٣٧٥٠ طائر للحظيرة ) استخدمت فى الدارسة لجمع النتائج خلال فترة الرعاية والانتاج . فترة الرعاية تبدا من عمر يوم واحد وتنتهى عند عمر ٢٤ أسبوع ثم تبدا بعدها فترة الانتاج والتي تستمر الى ٤٠ أسبوع انتاجى . نظام التهوية والتبريد المستخدم فى هذه الحظائر هو نظام مراوح الشفط والوسائد المسامية المبللة والتي بالابعاد ( ١٢ متر طول و٠.٩١ متر عرض ) موضوعة فى وسط كل جانب من الحظيرة بالاضافة الى عدد ١٦ مروحة شفط تعمل بمعدل ١٠,٠٠٠ متر<sup>٣</sup>/ساعة/ للمروحة موزعة على جانبى بداية ونهاية الحظيرة .

خلال الضغط السالب الذى تحدثه مراوح الشفط يدخل الهواء الجاف من خلال الوسائد المسامية المبللة ليتم تبريده ثم ينساب فى مسار طولى نحو مراوح الشفط الموزعة على جانبى بداية ونهاية الحظيرة . لوحظ ضعف التهوية وعدم فاعلية التبريد داخل الحظيرة



والمتمثلة فى ارتفاع درجات الحرارة وعدم تجانس التهوية الامر الذى اثر سلبا على اداء امهات التسمين .

وقفا لذلك تم تحسين مراوح التهوية والوسائد المسامية المبللة (خلايا التبريد ) فى اربعة حظائر اطلق عليها الحظائر المؤهلة وذلك بزيادة مساحة الخلايا المسامية لتصبح بالابعاد ( ١٢ متر طول و ١.٩١ متر عرض ) مع تغيير مكان الخلايا بوضعها على جانبى العنبر وفى البداية بدلا من الوسط . كما تم استبدال مراوح الشفط بمراوح تعمل بمعدل ٣٤.٠٠٠ متر<sup>٣</sup> /ساعة/للمروحة تم تركيبها فى نهاية العنبر اظهرت النتائج التى تم جمعها خلال مرحلتى الرعاية والانتاج فروق (P<0.01)

معنوية

فى درجات الحرارة الداخلية للحظائر حيث اظهرت الحظائر المؤهلة انخفاض فى درجات الحرارة الداخلية هذا الانخفاض كان بمعدل ٤ درجات مئوية خلال موسم الشتاء ومعدل ٣ درجات مئوية خلال موسم الصيف وذلك عند مقارنة الحظائر المؤهلة بالحظائر الغير مؤهلة . هذا التحسين الذى حدث فى درجات الحرارة الداخلية والتهوية للحظائر المؤهلة احدث فروقات معنوية (P<0.01) فى زيادة معدل استهلاك العلف خلال فترة التربية والذى بدوره ادى لزيادة كبيرة فى وزن الجسم مع انخفاض معدلات النفوق والاستبعاد . كما ادى هذا التحسين الى احداث فروقات معنوية (P<0.01) خلال مرحلة الانتاج فى ارتفاع معدلات استهلاك الاعلاف ونسب انتاج البيض ووزن البيض مع ارتفاع نسب الاخصاب وانخفاض فى معدلات البيض المبعد والنفوق .

هذه التأثيرات الايجابية ادت الى زيادة المردود الاقتصادي بالنسبة للحظائر المؤهلة بمقدار ٨.٢% عن الحظائر الغير مؤهلة كما ادت الى انخفاض التكلفة الكلية للانتاج بمقدار ٤.٣٨% بالحظائر المؤهلة .

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