INTRODUCTION
One of the most important Biotechnology in male animals particularly bulls is the artificial insemination (A.I.). Artificial insemination is easy and quick method to select and improve the best genetics and properties in animals (Bearden et al., 2004). In addition, A.I. has a special role in the control of disease speared and dissemination (Ball and Peter, 2004) .To improved A.I. you have to use bulls which can produce active fertile sperms, these sperms should have the ability to fertilize the eggs specially after semen dilution and cryopreservation (Chenoweth, 2005; Nur et al., 2006) . Sperms are usually effected by different internal and external factors including genetics, handling processing and management particularly the general health condition of bulls since infection could lead to decrease the quality of sperms and seminal plasma (Vale, 2009). Bacterial, viral and fungal diseases could infect the uro-genital tracts and subsequently semen quality will consider as a tool to reflect the severity of these diseases (Yates et al., 1989 and Schlegel et al., 1991). The genital tract infection may also have an influence on the reproduction age of the animal (Wentinka et al., 2000). Al- Badry et al., 2012 reported that the virus of foot and mouth disease is one of the most important disease infects bulls in Iraq and causing reduction in semen volume and sperms concentrations and viability. The effect of vaccination as it was reported by (Radhakrishnan et al 1975) could lead to increase the incidence of production of abnormal spermatozoa and decrease the resistance of spermatozoa to inconvenient environment and their metabolic activity as well as its effect on the secretary activity of the reproductive accessory glands. The aim of this work is to study the effect of rinderpest vaccination on the physical and biochemical properties of the semen Holstein bulls in Iraq.

MATERIALS AND METHODS
Fifteen Holstein bulls were used and maintained under uniform managerial conditions. Bulls were vaccinated with a recommended dose of Rinderpest (Al-Kindy Vet. Co.). Daily rectal temperature was recorded during pre and post-vaccination periods. Sixty semen samples were collected from bulls. Artificial vagina was used for semen collection. Semen was collected once weekly from each bull. A total of 60 ejaculates were used, 30 of them were collected within 10 days before and on day of vaccination and considered as pre-vaccination control samples and another 30 were collected at day 2 and day 9 post vaccination. The results showed that the volume of the semen remain unaffected after 9 days of vaccination, while sperm concentration and mass motility were significantly decreased at P<0.05, Individual motility was also reduced but at P<0.01. Glucose was significantly decreased at P<0.01 particularly at day 2 post Vaccination while LDH, total protein and phosphorus levels showed a significant decrease at P<0.05 particularly at day 2 after vaccination. The levels of seminal enzymes AST and ALT were also affected and showed a significant decline at P<0.01 for AST and P<0.05 for ALT particularly at day 2 post vaccination. In conclusion , bulls which had been vaccinated with rinderpest vaccine showed a significant changes represented by the decline in the physical and biochemical parameters of their semen represented by ( Mass and individual motility , Sperms concentration , Total protein , Phosphorus , Glucose , LDH , AST and ALT) particularly at day 2 post vaccination , never the less semen volume did not show significant change.

ABSTRACT
This study was carried out in Artificial insemination Center at Baghdad suburban to determine the effect of Rinderpest vaccination on the physical and some biochemical seminal plasma attributer parameters of 15 imported Holsteine bull. Artificial vagina was used for semen collection. Semen was collected once weekly from each bull. A total of 60 ejaculates were used, 30 of them were collected within 10 days before and on day of vaccination and considered as pre-vaccination control samples and another 30 were collected at day 2 and day 9 post vaccination. The results showed that the volume of the semen remain unaffected after 9 days of vaccination, while sperm concentration and mass motility were significantly decreased at P<0.05, Individual motility was also reduced but at P<0.01. Glucose was significantly decreased at P<0.01 particularly at day 2 post Vaccination while LDH, total protein and phosphorus levels showed a significant decrease at P<0.05 particularly at day 2 after vaccination. The levels of seminal enzymes AST and ALT were also affected and showed a significant decline at P<0.01 for AST and P<0.05 for ALT particularly at day 2 post vaccination. In conclusion , bulls which had been vaccinated with rinderpest vaccine showed a significant changes represented by the decline in the physical and biochemical parameters of their semen represented by ( Mass and individual motility , Sperms concentration , Total protein , Phosphorus , Glucose , LDH , AST and ALT) particularly at day 2 post vaccination , never the less semen volume did not show significant change.

KEY WORDS: Holstein bulls, Rinderpest vaccination, Semen quality
Glucose was determined by using glucose oxidase method mentioned by (Sadasivam and Manickam, 2008). The Colorimetric method was used to determine the total protein in seminal plasma based on the principle of biuret reaction test (Thimmaiah, 1999a). The phosphorus in the seminal plasma was determined by using the method used by (Thimmaiah, 1999b). In the statistical analysis was carried out by applying the program of (SPSS, 2008) and Group differences were determined using the least significant difference (LSD) test at $P<0.01$ and $P<0.05$ according to (Steel and Torrie, 1980).

RESULTS
Pyrexia in a range of 104.5-106.5 °F was registered in the vaccinated bulls and persisted for approximately 3 days post vaccination. Semen volume remained almost unaffected throughout the experiment, mass and individual motility of sperms were significantly decreased at $P<0.05$ and $P<0.01$ respectively during post-vaccination period. Sperms count or concentration also showed significant decline at $P<0.05$, (table 1). LDH, total protein and phosphorus were significantly decreased at $P<0.05$ particularly at day 2 post vaccination while glucose showed decline at $P<0.01$. The levels of seminal enzymes AST and ALT were also affected and showed a significant decline at $P<0.01$ for AST and $P<0.05$ for ALT particularly on day 2 post vaccination.

DISCUSSION
Elevated body temperature may alter the nature of cellular metabolism by increasing the metabolic rate and decreasing the life span of sperms (Koonjaena et al., 1997; Cholami et al., 2011). It appears that the mechanism of heat damage is initiated through tissue hypoxia (Waites and Moule 1960, Radhakrishnan, 1975). The volume of the semen did not show significant change since the sexual accessory glands remains secreting seminal plasma but vaccination may affect on the consistency of such plasma and this result agrees with the findings of ( Albert, 2002; Bhakat et al, 2008; Al-Badry et al, 2010) in FMD vaccination. The seminal plasma provides a nutritive and protective medium for spermatozoa during their journey through the female reproductive tract (World health organization (2003)), and the significant $P<0.05$ decrease in glucose and phosphorus levels in the seminal plasma could retard the activity and fertility of sperms since glucose is the main source of nutrition for sperms (Harvey, 1948) and phosphorus is the main source of energy supply to sperms represented by its main component in adenine triphosphate (ATP) ( World health organization, 2003).

Seminal enzymes AST and ALT play a major role in regulating and modulating the biochemical reactions in sperm cells thus the significant decrease and imbalance of such enzymes may induce a reverse effect on the semen quality (Barth and Waldner, 2002). The alkaline bases of ALD in the seminal plasma have a counteract effect on the acidic environment of the vaginal canal and protect DNA inside the sperm from acidic denaturation. As it is shown in table (1), mass and individual motility had been significantly reduced perhaps due to the decline in the sources of energy supply to sperms. However, Usmani et al., 1993 and Li-Junjie et., 2001, they reported that motility of sperms reduced significantly in hot and humid season. In the same table, sperms concentration was also affected and showed significant decrease probably due to the subsequently decline in epididymal sperm reserves, thus concentration decreases as the resorption of abnormal sperms increase (Rao et al., 1980). In addition, spermatogenesis may also be retarded since this process needs a temperature lower than that of the body in at least 2-4 °C (Janus-kauskas et al.,1995 and Marray 1997).

Table 1. Effect of Rinderpest vaccination on semen volume, sperm concentration and motility in Holstein bulls (M±S.E.).

<table>
<thead>
<tr>
<th>Vaccination Program</th>
<th>Sample No.</th>
<th>Individual motility %</th>
<th>Volume MI</th>
<th>Mass motility %</th>
<th>Concentrations (10^6/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre vaccination</td>
<td>15</td>
<td>67.12±1.22</td>
<td>4.11±0.46</td>
<td>84.59±5.76</td>
<td>821.1±15.10</td>
</tr>
<tr>
<td>vaccination day</td>
<td>15</td>
<td>72.12±5.73</td>
<td>4.76±0.49</td>
<td>80.6± 6.12</td>
<td>799.9±10.90</td>
</tr>
<tr>
<td>2 days Post</td>
<td>15</td>
<td>47.5±8.73</td>
<td>5.17±0.87</td>
<td>60.6±4.37</td>
<td>707.7±11.64</td>
</tr>
<tr>
<td>9 days post</td>
<td>15</td>
<td>51.82 ±5.36</td>
<td>4.55±0.34</td>
<td>70.75±3.37</td>
<td>727.8± 9.56</td>
</tr>
</tbody>
</table>

N.S = Not Significant
The effect of Foot and mouth disease on reproductive health.

**Table 2. Effect of Rinderpest vaccination on total protein, phosphorus and glucose in the semen of Holstein bulls (M±S.E.)**

<table>
<thead>
<tr>
<th>Vaccination Program</th>
<th>Sample No.</th>
<th>Total protein g/dl</th>
<th>Phosphorus mg/dl</th>
<th>Glucose Mg/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-vaccination</td>
<td>15</td>
<td>18.41±0.68 b</td>
<td>48.78±3.15 a</td>
<td>192.00±19.78 b</td>
</tr>
<tr>
<td>Vaccination day</td>
<td>15</td>
<td>22.80±0.37 a</td>
<td>51.26±2.58 a</td>
<td>261.6±17.28 A</td>
</tr>
<tr>
<td>2 days Post vaccination</td>
<td>15</td>
<td>16.56±3.43 b</td>
<td>36.67±8.76 c</td>
<td>145.67±14.01 B</td>
</tr>
<tr>
<td>9 days Post Vaccination</td>
<td>15</td>
<td>18.62±1.31 b</td>
<td>44.92±3.59 a</td>
<td>199.75±17.77 B</td>
</tr>
</tbody>
</table>

**Table 3. Effect of Rinderpest vaccination on AST, ALT and LDH enzymes in the semen of Holstein bulls (M±S.E.)**

<table>
<thead>
<tr>
<th>Vaccination Program</th>
<th>Sample No.</th>
<th>AST Iu/L</th>
<th>ALT Iu/L</th>
<th>LDH Iu/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre vaccination</td>
<td>15</td>
<td>1012.73±60.92 A</td>
<td>134.55±12.82 b</td>
<td>5543.64±404.01 a</td>
</tr>
<tr>
<td>vaccination day</td>
<td>15</td>
<td>1035.00±41.77 A</td>
<td>170.00±24.08 a</td>
<td>4635.4±211.15 b</td>
</tr>
<tr>
<td>2 days Post vaccination</td>
<td>15</td>
<td>392.00±65.65 C</td>
<td>60.33±8.58 c</td>
<td>3913.33±527.5 c</td>
</tr>
<tr>
<td>9 day Post Vaccination</td>
<td>15</td>
<td>813.72±51.34 B</td>
<td>121.32±15.16 b</td>
<td>4697.45±380.91B</td>
</tr>
</tbody>
</table>

**REFERENCES**


Evans G. and Maxwell W.M.C. (1990), Artificial insemination of sheep and goats. Butter Worth’s, Sydney, Australia.


